COMMODORE

BUYER'S ISSUE

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OCTOBER 1986

COMPUTING INTERNATIONAL

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64C·64C

Hands on the 64C!

Add-ons — 16 page Buyer's Guide

7 New Joysticks!

128 Special Feature

GamesWorld— Hits Time for 64, C16, 128 and Amiga

Hi-Adventure! Featuring Fighting Fantasy & MicroMud

Plus Exclusive interview with Arthur C. '2001' Clarke and his Amigas

WIN! WIN! WIN! A SOLID GOLD DOMARK TRIVIA SET, PILES OF 64/C16 GAMES, BOOKS, AND A DISK DRIVE AND LOTS, LOTS MORE...

Good news!

If you want to get the most out of your Commodore 128 or 64, we have goods news for you. The Pocket 128 and 64 Series of Software both offer you serious, professional quality software packages that are easy to use and inexpensive.

How easy?

Pocket 128 or 64 Software is so easy, you're ready to start using it as soon as it's loaded into memory. Even if you've never been in front of a computer before, you'll be up and running in thirty minutes. In fact, you probably won't ever need the reference guide . . . 'help' is available at the touch of a key. That's how easy.

How serious?

Pocket 128 or 64 packages have all the power you're ever likely to need. They have all of the features you'd expect in top-of-the-line software, and then some. The good news is that Pocket 128 or 64 Software Packages are priced way down there . . . where you can afford them.
Fast, powerful, easy to learn and inexpensive.
Say, that is good news!

All for one and one for all

Pocket 128 or 64 Software Packages offer you something else you might not expect . . . integration. You can combine the output of Pocket Writer, Pocket Filer and Pocket Planner into one piece of work. You can create a finished document with graphs, then send individually addressed copies.

The bottom line is Solutions

The word solutions is our middle name and bottom line. When you purchase Pocket 128 or 64 software, you can count on it to solve your problems.

For information write to:
Digital Solutions
30 Wertheim Court, Unit 2
Richmond Hill, Ontario
Canada L4B 1B9
telephone (416) 731-8775

™PaperClip is a registered trademark of Batteries Included

™Visicalc is a registered trademark of Software Arts

Pocket Writer 128 or 64 Word Processing

What you see is what you get

With Pocket Writer 128 or 64, there's no more guessing what text will look like when you print it. What you see is what you get . . . on screen and in print. There are no fancy codes to memorize, no broken words at the end of a line.

Easy to learn and sophisticated. Pocket Writer 128 or 64 offers standard word processing features plus . . .

- on-screen formatting and wordwrap
- on-screen **boldface**, underlines and *italics*
- no complicated format commands to clutter text
- on-screen help at all levels
- spelling-checker lets you add words to your dictionary
- 40 or 80 columns on screen
- files compatible with PaperClip™ or other word processors

Pocket Planner 128 or 64 Computerized Spreadsheet

Make fast work of budgeting and forecasting

Pocket Planner 128 or 64 software lets you make fast work of all your bookkeeping chores. Cheque books, household accounts, business forecasting and bookkeeping are just some of the jobs that Pocket Planner 128 or 64 packages make easier. You can even create four different kinds of graphs.

Accurate, sophisticated and easy to use. Pocket Planner 128 or 64 offers standard spreadsheet features plus . . .

- accuracy up to 16 digits, about twice as many as most spreadsheets for the Commodore 128 or 64
- sideways printing available on dot matrix printers, for oversized spreadsheets that won't fit on standard paper
- **on-screen help** at all levels
- compatible with VisiCalc™ files
- 80 column on-screen option for the Commodore 64 in addition to the standard 40 columns
- graphics include **bar**, **stacked bar**, **line** and **pie** graphs that can also be used in word processing files
- **smart evaluation** of formulae for accurate complex matrices

Pocket Filer 128 or 64 Database Manager

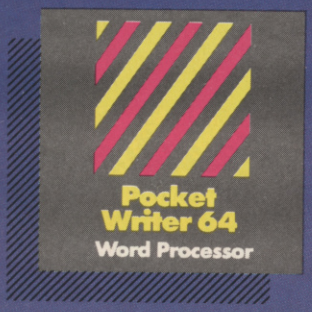
Database management made easy

With Pocket Filer 128 or 64, you can organize mailing lists, addresses, inventories, telephone numbers, recipes and other information in an easily accessible form. Use it with Pocket Writer 128 or 64 (or other word processors) to construct individually customized form letters.

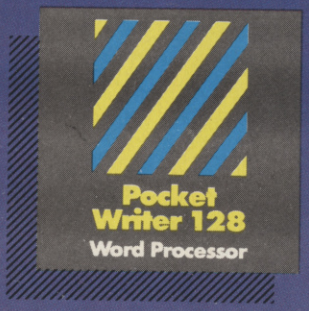
Pocket Filer 128 or 64 packages are fast, sophisticated and truly easy to use. In addition to standard database features they offer . . .

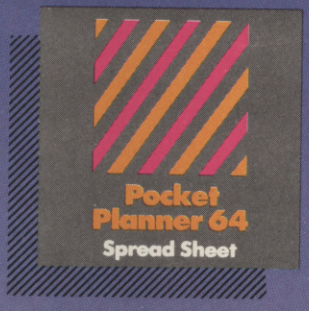
- use up to 255 fields per record (2,000 characters per record)
- sorts by up to 9 criteria, can save 9 different sorts
- print **labels** in multiple columns
- flexible report formatting including **headers** and **footers**
- optional password protection including **limited access viewing** or **updating**
- on-screen help at all levels
- print from any record to any record
- arithmetic and trigonometric functions in **reports** using up to 16 digit accuracy

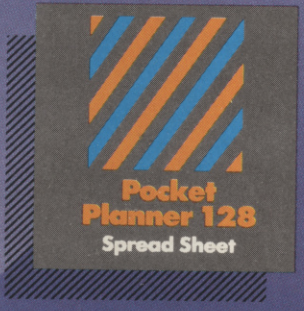
Solutions!



PW 128/64 Dictionary
also available







Best-selling software for Your Commodore 128 or 64

You want the very best software you can find for your Commodore 128 or 64, right?

You want integrated software — word processing, database and spreadsheet applications — at a sensible price. But, you also want top-of-the-line features. Well, our Pocket 128/64 software goes one better.

With Pocket 128 or 64, you'll find all the features you can imagine . . . and then some. And Pocket 128/64 is so easy to use, you won't even need the reference guide. On-screen and in memory instructions will have you up and running in less than 30 minutes, even if you've never used a computer before.

Pocket Writer 128 or 64, Pocket Planner 128 or 64 and Pocket Filer 128 or 64 . . . **Solutions** at sensible prices from Digital Solutions Inc.

Serious software that's simple to use.

International & Distributor enquiries to:

Digital Solutions Inc.

30 Wertheim Court, Unit 2
Richmond Hill, Ontario
Canada L4B 1B9
Telephone: (416) 731-8775
FAX: (416) 731-8915
Telex: 06-964501

Pocket Writer 128 and 64 are available in French — full AZERTY keyboard support.

116 pages of probably the best Commodore magazine in the Universe!

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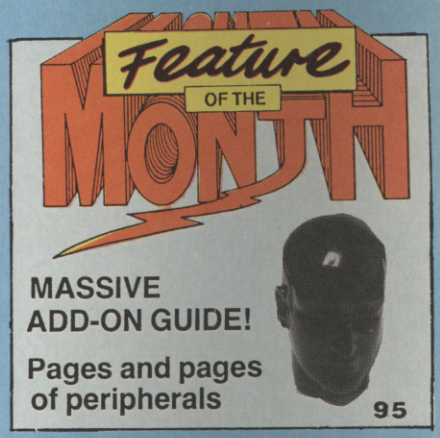
October 1986



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Computer dictionaries and Arthur C. Clarke books... Leap into top gear with a disk drive... 25 Droids... 25 Winter Events

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CCI View

Dear Reader,

With Commodore nothing is as simple as it seems. While doom-laden predictions say CBM is falling, Commodore computers take almost half the sales of games software in the UK. Can Commodore last, they ask? Yet the 64 is selling more software than ever before. Point to discontinued production lines like the Pet and the Plus 4 and someone will tell you that one company alone bought £20,000 of Pets recently because they can't meet the demand for spares from people who refuse to let the Pets go. Now we've heard of 10,000 new Plus 4s being produced for export to Hungary!

The 64 is dead, long live the 128? Not on your life! In comes the new 64C and perhaps the 128 is out. Amigas? An iffy computer divided between the home in the US and business elsewhere? Now CBM comes up with a bigger range (see More Amigas article) that will really be ideal for both.

The truth is that Commodore is an example of a business — computing — where the only thing you can reliably expect is the unexpected. Ideas move so fast and conditions change so rapidly that predictions are overtaken before they can be absorbed. Future shock . . . self fulfilling prophecies . . . optimism of the will . . . that's what makes the state of the art.

Have you heard the expression "Vapourware"? It was new to me. It means the kind of software that may be great, gets talked about, even written about as if it were already a fact but really only exists in its designer's mind.

Somebody told me the other day that the reason for "vapourware", for software that is announced and takes ages to arrive or never even appears, was the fact that programmers think something actually is done, finished when they have only thought how to do it.

The whole computing world sometimes seems like that — insubstantial, slightly unreal, even crazy. Could it be a reflection of that creative and infuriating instrument — the human mind? Maybe Commodore is a figment of our collective and slightly unbalanced imagination. So it's no use worrying or trying to predict what Commodore will do next! Just stay cool and enjoy it.

Yours sincerely,

Antony H. Jacobson
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...news...news ...news...news

Correction

★ Colleen's Music Package costs £29.95, not £49.95 as incorrectly stated in last month's C.C.I. Even better value for your money!

★ The prize in our Ariolasoft Football competition is the poster *not* the game.

Dynamic Duo

Hardworks (we *believe* they used to be ZERO...) have released two new products:

A 16K SOFTPROM RAM cartridge with battery back-up for CBM 64 only. Save Basic or Machine-Code programs to the SOFTPROM. Even Basic programs can Autostart. Price is £41.00 plus £1.00 p&p. They have previously been selling the 8k version.

For VIC 20, CBM 64, Plus 4, C16 & C128. T Switch Plug 2 computers to one set of peripherals using the serial port. Any combination of the above computers can be used. A switch determines which computer can access the disc &/or printer. Also incorporates a separate push-button reset for the devices attached. This unit is manufactured in our own workshops. Current selling price is £24.50 (inc p&p).

Citizen's 50,000th Printer

Citizen Europe, the recent major entrant into the computer peripheral market, announced the shipment of their 50,000th printer after just 10 months of trading.

"The shipment of our 50,000th printer marks a significant milestone for us", said Jack Bennett, Citizen's Vice President sales and marketing. "Our original goal was to ship 20,000 units by March 1986 and 80,000 by March 1987. Our actual performance to date has been so outstanding that we are now well on our way to achieving our revised projection of shipping 160,000 units by March 1987.

Wheeler Dealers

TYNESOFT has recently completed a licensing deal with Alligata Software to re-lease for the C16 "WHO DARES WINS II". A provisional release date is September.

TYNESOFT has also signed a licensing deal with Software Projects for "JET SET WILLY II" on the C16 — to be released on the Tynesoft label, as was the version of JET SET WILLY I.

Another licensing deal has also been signed with Adventuresoft to distribute seven previously unreleased Scott Adams Graphic Adventures. Savage Island I and II are the first titles to be released in September on the following machines — CBM64, C.16, and Plus 4, which will be the first graphic Adventure on the Plus 4.

Tynesoft would also like to point out any reference in Charts etc. of Jet Set Willy on the C16/+4, should read Jet Set Willy — Tynesoft *NOT* Jet Set Willy — Software Projects.

Screenvision

A colour television and composite video facility for just £89.95. Northwood based distributors Screens and their 'Screenvision' means all RGB colour monitor owners can have a full colour television and composite video facility by simply plugging their monitor into Screenvision.

Manufactured in a slimline, two tone grey cabinet each Screenvision has push button channel selection, separate controls for volume, colour and contrast, LED status indicator, built in audio and composite video output and power supply. An auxiliary power connector is also provided for direct monitor/Screenvision connection.

'Screenvision' is compatible with most Philips, Microvitec, Sanyo, Decca, Hitachi and other RGB monitors. Any additional cable required for certain monitors can also be obtained from Screens.

Contact: Screens, Northwood 20664.

Filemaster

Robtek produced the first utility cartridges on the market, and are now releasing an easy to use database for the home or professional users of the Commodore 64 and 128 (for both the 64 and 128 modes)

The floppy disk has the 64 mode version on one side and the 128 version on the other.

Filemaster works in the new unique window system in the same way as the Atari ST computers.

If you decide to upgrade from 64 to 128 — no problem — not only do you have a database for the 128 mode but all the 64 mode files are compatible in the 128 mode.

The word processor and spreadsheet version are coming soon too.

Price £29.95

Available August

Contact: Robtek Ltd, Unit 4 Isleworth Business Complex, St Johns Road, Isleworth, Middx. TW7 6NL.

Telephone: 01-847 4457.

Star Trek — the computer game

Beyond are very pleased to announce that they have been appointed by Paramount to produce the first official Star Trek arcade/strategy game.

1986 sees the 20th anniversary of Star Trek and from September onwards countless conventions will be taking place around the world. Francis Lee, publisher of Beyond Software, commented: "We are very proud to be playing such an important part in this major happening, and we have no doubt that the Star Trek project will be the most significant licensing deal signed this year." The game will be launched in late September; this will coincide with BBC Television re-running the Star Trek series from mid-September.

The team designing and programming the game is headed by Mike Singleton and is supported by a cast of programmers.

...news...news...news...news

Graffcom goes for gold

Graffcom Systems has announced the launch of a Telecom Gold module complete with error protection. The new module is available within Graffcom's WP2020 word processing system and provides a very easy to use interface with Telecom Gold for sending files and documents.

WP2020 runs on most popular microcomputers which have MS-DOS or CCP/M.

The Telecom Gold module allows the user to automatically dial into the mailbox service, then using the 'pop-up' menus mail can be prepared using the powerful WP2020 editing facility and then sent. Other options include retrieving mail and storing on disk and printing concurrently.

Richard Owen, Technical Director of Graffcom, commented 'One of the main problems with transmission of text in and out of Telecom Gold is that if there is any interference on the line then characters can get lost or 'bits dropped'. This is not satisfactory when financial documents such as spreadsheets are sent or retrieved.

To date Graffcom have sold over 6,000 WP2020 systems. The price of WP2020 is £350 and £450 with the Telecom Gold RAP option.

Piranha is here!

Macmillan is sinking its teeth into the games market with a new games label called Piranha from the "small but lethal" Piranha team at the company's Strand offices.

Piranha's first attack will be 5 games with emphasis on character licensing and film and television tie-ins.

Says Mandy Keyho, Piranha's Editor, "We are only too aware of the pitfalls of licensing, but are determined to match the strength of our licenses with the quality of the games themselves."

Piranha are working with companies such as Design Design and Delta 4.

Kempston Mouse for Commodore

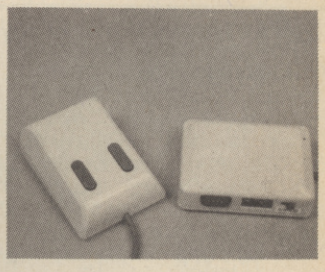
Kempston have launched a Mouse for Commodore 64.

The Mouse, which uses an optical system to decode movements of an internal tracker ball is precisely monitored by the interface using a simple port read. This means that the protocol can be easily incorporated into existing or future graphics and business packages.

The protocol utilised in the Mouse Interface is compatible with major releases from leading software houses including Fleet Street Editor by Mirrorsoft.

Price, complete with dedicated Interface, £69.95 inc VAT.

For further information contact Kempston Micro Sales
Unit 4 Manton Lane
Bedford
MK41 76HY
Tel: (0234) 327544.



Micro Scope's Holidayfax

Micro Scope have developed a new late availability flight ticket service for Holidayfax. The new system is installed in the British Rail concourse at the Gatwick Airport.

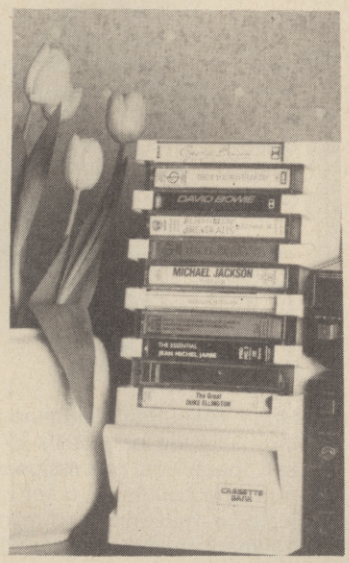
For the first time, passengers will be able to book a seat on a charter flight for departure the same day, and immediately collect their ticket at Gatwick Airport.

Reservations can be made by telephoning the Holidayfax office, or any travel agent with videotex access to the Holidayfax database and the ticket will automatically be printed at Gatwick Airport.

Tickets are printed using Micro Scope's new secure printing system, connected to the Holidayfax late availability reservation system, also supplied by Micro Scope. The system allows valuable documents, such as tickets, to be printed remotely with total security from operator intervention or line noise. The system ensures that the airline tickets printed at Gatwick are completely error free (they tell us!).

Holidayfax specialises in late availability flights, with the facility to actually book flights rather than just being referred to the appropriate tour operator's brochure.

Contact: Micro Scope.



The Listening Bank

The Cassette Bank is a cassette storage unit, compact in design, rectangular in shape with a unique cassette selector mechanism. Capable of storing 10 cassettes firmly in place, the Cassette Bank has a movable arm at the base of the 12in unit which enables the selection to be made whilst holding the rest of the cassettes in place.

Cost: £4.95.

Contact: Quillgold House, West Stone, Berry Hill Industrial Estate, Droitwich, Worcestershire WR9 9AS. Tel: 01-935 0993.

Masterpiece's Masterswitch

The Masterswitch allows up to three signal sources to be connected to one TV receiver and eliminates the need for repeated plugging and unplugging of the aerial lead, when using the TV with a number of other pieces of equipment, for example: a computer, a video recorder and a satellite TV converter or cable TV input. It may also be used to provide switching of one signal source to up to three different outlets. For example, the family video recorder output could be switched to any one of a number of TV receivers, allowing a video to be viewed in a bedroom, or other room, remote from the video recorder itself.

The design and manufacture aim to ensure low signal loss and a high degree of isolation between adjacent inputs, resulting in minimal degradation of signal.

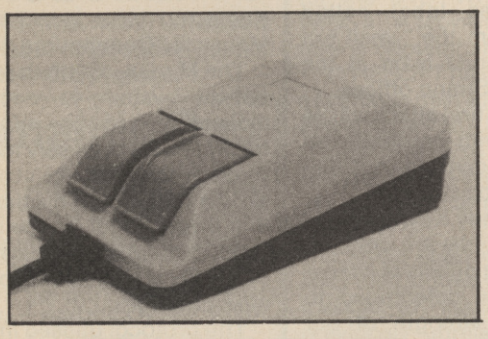
The complete unit, moulded in 'Hi-Tech' grey polycarbonate material, is ultrasonically welded, further ensuring long term switching reliability.

MS2000/NEOS MOUSE

★ FASTER INTERACTION ★ ICON SOFTWARE
★ CREATIVE GRAPHICS ★ STUNNING PACKAGES

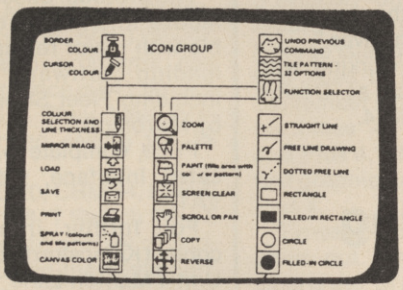
Mice are tops for cursor control peripherals because of their speed, comfort, friendliness and accuracy. This is the top Commodore mouse with optical encoding and 100 points to inch resolution.

CBM 64/128



Art Graphics Design Cad Drawing Business

16 Colour package



Command and Control

Commodore Horizons "Certainly the best mouse for the 64"

WOW! Mouse + "Cheese" Cassette = only £44.90

NEW! ARTIST 64 Mouse or Joystick

This is the most sophisticated, powerful and advanced art or graphics package available on a CBM 64 or 128. The BBC version was reviewed as "powers undreamed of" and "finest graphics aid I have ever seen". NOW — available on CBM on cassette or disc. Takes over where cheese leaves off. Although friendly and fun — can be used professionally with over 250,000 combinations of commands.

★GIVE YOUR 64/128 — AMIGA TYPE GRAPHICS★ Full colour working. Full screen working. Zoom and Pan. Create any brush, fill, pattern or icon. Variable Text. Commodore and Epson printdumps. Add other print routines. Innovative colour commands. "Over and Under" — (Colours weave over and under each other) "Colour Cycling" "Duplicate objects without certain colours." See C.C.I. Review Oct. 86.

Cassette or disc = £34.90 WOW! Intro offer £29.90 (1 month only)

NEW! DESK TOP! Mouse or Joystick or K Board

Fascinating Range of utilities handy facilities. 100 year calendar. Diary. Clock. Calculator.

Disc Utilities. Name/Addr. Directory. Cassette and Disc ONLY £18.50

MS2000 PACKAGE Price Saver! MOUSE + CHEESE CASSETTE + CHEESE DISC + DESK TOP CASSETTE AND DISC PACKAGING

USER MANUAL + GIFT **ONLY** £69.90 INCL. VAT. INCLUDED

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London W1X 1AG
01-734 8826

Dealer, Export and Educational Enquiries Welcome

...news...news

£1,000 Cash Prize in Software Competition

Micronet, the residential database on Prestel, have joined forces with PHAB, the organisation that promotes better understanding between the physically handicapped and the able-bodied, in a nationwide search for a piece or educational software.

The competition is open to all U.K. residents and the closing date is 30 November 1986.

The objective is for entrants to write a piece of software, the aim of which is to increase the understanding/awareness in able-bodied people of the problems which society creates for the physically handicapped.

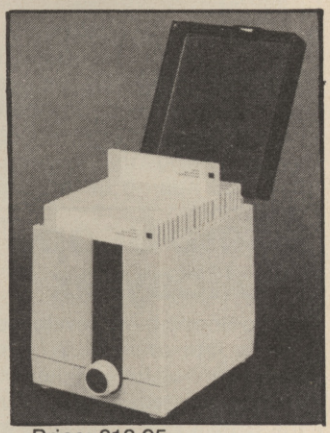
The entry judged to be the best will win its author £1,000. please contact:
Peter Probert
Micronet 01-278 3143

Dial and File

DNCS have introduced an innovative product to their range of magnetic media storage, new micro diskette storage box.

The 'Dial and File' box has a capacity of 20 3.5in diskettes.

Individual disk selection is by turning the dial on the front of the unit the unique wave like action raises the diskettes one at a time to enable efficient and quick identification.



Price: £13.95.
Contact: DNCS, Tel: 0706 67567.

Change of Direction

Hugh Rees-Parnell, Managing Director of Activision's UK operations, has resigned from the company to set up his own marketing and management consultancy. He will in future be gearing his considerable talents towards the entertainment industry.

His efforts have helped in Activision's rise to the forefront of the home computer software industry and now that his aims have been accomplished, he feels that the time is right to move into other areas.

Paying tribute to Hugh's contribution to Activision, Rod Cousens, Group Managing Director said, "Hugh and I have enjoyed a close working relationship and I am sorry we shall be losing him. The Company has grown and developed under his leadership and we all wish him success in his exciting new challenge."

Further Releases from CRL

CRL has announced a number of conversions available for their recent releases.

Commodore disk versions of The Very Big Cave Adventure and Bored of the Rings will be available from 21st July, both priced at £12.95.

The Rocky Horror Show Commodore 128 version with redefined graphics, brand new sprites, new animation, even more locations and some stunning effects, released on 30th August, retails for £9.95 on cassette and £14.95 on disk.

The 3D ball game, Room 10, will be available on Commodore disk, released at the end of August, at the same time as the Commodore cassette version, retails for £12.95.

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Simons Basic Extension, Disc	~~£19.95~~	£12.95
Commodore 64 Programmers' Reference Guide	~~£9.95~~	£7.50

LOGO + PILOT

2 Educational Languages, Disc	~~£64.90~~	£14.95
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Magpie (Database), Cartridge & Disc	~~£89.95~~	£17.95

HANDIC

Diary, Cartridge	~~£29.95~~	£9.95

PRACTICORP

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Practicalc (Spreadsheet), Tape	~~£39.95~~	£9.95

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Ashes to ashes... did Bobby stand on the burning DEC?

Soaped-Up Universe

There is no doubt about it. At last computers are beginning to find some really useful projects to work on.

Michael Lebowitz, a professor of computer science at Columbia University in New York City, has developed a computer program called Universe which automatically generates plot outlines for soap operas. He painstakingly monitored soap operas over a two-year period and noticed several distinct patterns.

These all involve lovers and the forces keeping them apart. Dead spouses who later turn out to be alive is one important pattern, and another is lovers who contract a disease, usually amnesia. Using the artificial intelligence language Lisp, and a DEC 20 mainframe with Lebowitz's soap opera research findings as the systems database, Universe can produce its own soapy plots.

Lebowitz is confident that Universe can generate a wider range of plots by expanding its knowledge base. This will require a lengthy study of many soap operas. Oh dear!

Now we know what the problem is in the famous definition of a computer as 'a solution looking for a problem to solve'. Something really of grave importance to the human race. What will the next twist be in Dallas or Dynasty. Boot up the DEC, will you, and let's get the script for the next episode.

Robtek's Turbo

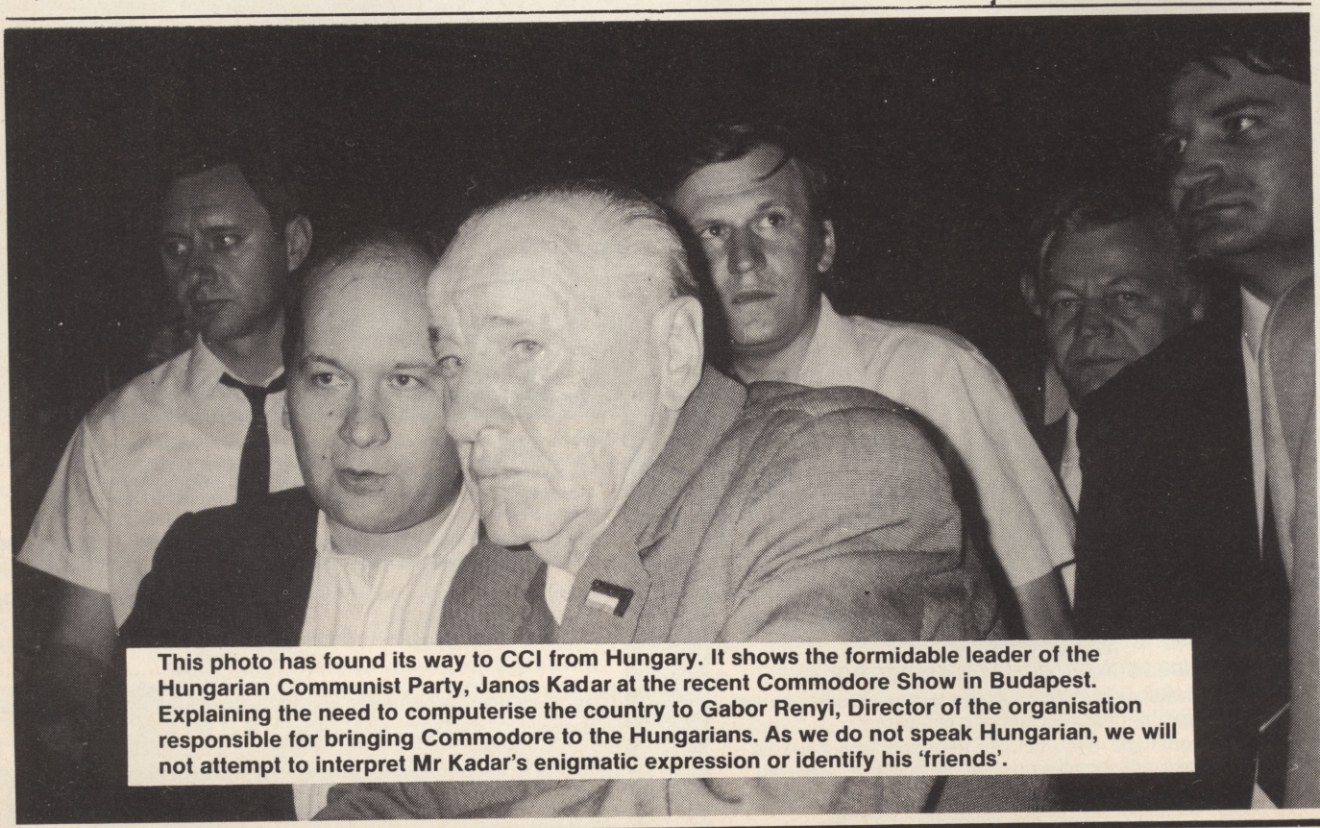
Robtek have released a 'King Size' C16/+4 Turbo, claimed to load and save programs 10 times faster. The new Turbo costs £4.95. Same price is another Robtek C16/+4 product — Turbotext, an easy to use word processor including the 10 times faster turbo loader.

Players Please

There is a new player in the cheapo game market called — wait for it — Players. They are releasing at the rock bottom price of £1.99 a series of games for Commodore computers, mostly 64's but curiously, and laudably, one for the good old VIC 20. The 64 list so far includes Ronald Rubberduck, It's Clean Up Time, Velocipede I and II, Fruity, Desert Hawk and Electrix. For C16's there are Killapede and Amiga, and the VIC title is Hunchy. The Players label comes from Interceptor, well known in the past for quality titles on the 64.

For Your Diary

A number of people have contacted us about the recent mention we made of the National Public Domain Software Rental Centre. The address is 1533 Avonhill Drive, Vista, CA 92084, USA. Telephone: (619) 749-7534



This photo has found its way to CCI from Hungary. It shows the formidable leader of the Hungarian Communist Party, Janos Kadar at the recent Commodore Show in Budapest. Explaining the need to computerise the country to Gabor Renyi, Director of the organisation responsible for bringing Commodore to the Hungarians. As we do not speak Hungarian, we will not attempt to interpret Mr Kadar's enigmatic expression or identify his 'friends'.

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★ Recommended by Commodore

Using PETSPEED couldn't be simpler; just type in the name of your program, wait a few minutes and then see your software run up to 40 times faster.

NEW FOR THE 128
★ Users entire 128K memory
★ Compiles ALL BASIC 7.0 commands
★ Handles user written extensions to BASIC
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The ultimate utility pack for the 128

★ **FULL TOOLKIT** commands include FIND, CHANGE, DUMP, MERGE, TYPE, INFO etc

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★Amiga style **RAM-DISK**

Imagine a disk drive like the 1541 or 1571 only many times faster. This is RAM-DISK. RAM-DISK responds to all the usual disk commands such as DLOAD, DSAVE, DOPEN, COPY, APPEND, CATALOG etc and behaves exactly like a floppy drive. The only difference is that everything happens much faster. RAM-DISK is modelled on the RAM-DISKS supplied as standard on the AMIGA, the ST and the AMSTRAD and provides a way for you as a programmer to fully exploit the 128's large memory. The COPY command can be used to move files from a physical disk drive to RAM-DISK and vica versa. At the end of a session all the files held on RAM-DISK can be backed up onto floppy disk. RAM-DISK is accessible from BASIC or machine code.

NEW

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The compressor is a utility for compressing programs down to their minimum size. Just type in the name of your program, wait a minute or two and then see a new version with all spaces and REMs removed and with up to 255 characters packed onto each line. Makes your code smaller and faster and protects programs from unauthorised tampering.

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Graham Gooch's Test Cricket — A Hardy Perennial

Audiogenic Software aims to make Graham Gooch's Test Cricket into a 'hardy perennial' of the software market. According to Audiogenic's Henry Smithson, "We aim to make Graham Gooch's Test Cricket into a hardy perennial of the software market by means of conversions and continuous improvement. We are about to release updated versions for the 64."

Updates to the 64 version include changing the built-in squads of England and Australia players and their averages to reflect the 1986 test squads which, for reasons obvious to cricket followers, are considerably different to last year. Also, on the Commodore version the free extension program that enables users to enter their own teams has been improved, and teams can now be more easily saved and loaded into the game. All copies of these updated versions will be flashed "NEW 1986 VERSION" on the front cover.

Available for the C64 on cassette at £9.95 and on disk at £11.95.

Golden Oldies

Have you got an IBM mainframe, say ten years old, lying around the place? Don't throw it away! It's estimated that the precious metal content, i.e. the gold etc, of the circuit boards of the old half a ton mainframes would today fetch around £500. Pre-1978, IBM mainframes are in great demand for stripping down. When gold was selling, in 1980, at $800 per ounce, fortunes were made from computer junkyards. Now, computers use less valuable precious metals like Palladium only about $100 compared to gold at $300. A new mainframe at Palladium prices will now only be worth about £180. Not a lot when they cost around £100,000 new. . . .

Top Selling Packages

Accounts packages were the top selling PC software in the first quarter of 1986 in the UK.

According to market research company, Context, accounts packages were 35% of all PC software sold. Integrated packages, including spreadsheet and graphics programs like Lotus 1-2-3, took second place with 22%. In third place word processing took only 15% of all packages sold.

The top selling individual program was Pegasus. Context says that £2.4m worth of the package was sold in the first three months of the year. Lotus' 1-2-3 came second with £2.2m of sales and Ashton-Tate's dBase III third with £1.3m.

The leading word processing software, in terms of units sold, was IBM's Displaywrite. Micropro's Wordstar, Wordstar Professional and Wordstar 2000 took the next three places.

Micropool's UK 1st

Micropool, the company of European Distributors which exports UK software, has reversed the trend with its first software release in the UK.

'Mission Elevator' is an arcade adventure which takes place in one of the Central Intelligence Units of the FBI which has been overrun by Foreign Agents.

OUR HERO, sent in by his superior to find the clues, get to the 62nd floor and stop the bomb, is the one and only Trevor. (Trevor? Overrun by foreign agents? Where do they get these ideas from? Ed.)

Mission Elevator is available for CBM 64 (tape £9.95 and disk £12.95).

Contact: Micropool, 4 Mercury House, Calleva Park, Aldermaston, Berks

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Now the great record-breaking Commodore Show moves North

Renold Building, UMIST, Sackville Street, Manchester

Friday to Sunday, September 12, 13 & 14

The Official Commodore Computer Show – the show that hit the headlines when it attracted record London crowds in May – now moves North, with lots of bargain offers from leading suppliers of Commodore hardware and software. Spread over two exhibition floors will be stands featuring the very latest developments for the entire Commodore range, including a wide variety of newly-released games, business and utilies software. It's going to be an action-packed show that will bring you right up to date with all the many exciting developments now taking place in the Commodore world!

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Demonstrations of the most talked-about computer of 1986, showing the growing range of business and recreational software.

8-BIT THEATRE
Leading Commodore experts show how to make the most of the 16, 64 and 128 range, answering questions on games, graphics, utilities and communications.

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Inside Info

THE BIGGEST -EVER PCW SHOW?

Britain's biggest-ever Personal Computer World Show opens its doors to the public on 5 September with a dazzling array of software and accessories for home computer users.

New adventure and arcade games are being launched by all the big names — and some talented newcomers. Look out for music kits and family entertainment games, accessories like modems, lightpens and joysticks, plus learning aids and lots of useful software.

This is the 9th event in the series, and the third to take place at London's Olympia. The first two days are for trade and business visitors only, and the show then opens to the public from Friday to Sunday, 5-7 September. And as usual, they'll certainly pour in. Estimates are for around 40,000. Arcade action is the theme of the US Gold stand, featuring some of the best coin-op games converted for home computers, including titles such as Express Raider, Gauntlet and Breakthru.

Domark offers something different: Trivial Pursuit, based on the best-selling board game of which nearly 70 million copies have been sold worldwide, including three million in the UK. Mark Strachan, Domark's joint managing director, said: "At last, here is a game for all the family - Mum and Dad included."

The show will be the launch pad for three new series of budget games from Blue Ribbon Software - including Astro Plumber, Diamond Mine II and Darts, all of which first appeared on the BBC — plus a new release, M-Droid, which will appear on other machines shortly.

Cheetah will be with digital sound samplers — for the "N-n-n-19" effect — and MIDI interfaces also their new Model I joystick.

Elite will be previewing its Christmas line-up, including arcade hits from Japan and America, plus the debut of The New Scooby Doo written by Gargoyle Games, together with the latest classics from the back catalogue, now being re-issued at pocket money prices.

On a more serious level, Mirrorsoft will be showing new versions of Fleet Street Editor, the desktop publishing program which has been a best-seller on the BBC and is now becoming available for other machines. Precision will be showing off their AMIGA range. From Tasman comes a range of wordprocessing software and similar products, now available on a wider range of machines including Commodore, and the growing range for Plus/4 — C16 games will be supported on many stands. And Bulletin 1000 will be showing their latest video magazine. The layout of the PCW Show follows the pattern set last year: Olympia 2 is reserved for business and professional users, while the National Hall includes products for both home and business — with the accent on computing for leisure and entertainment.

CCI 64Cs

As usual CCI is leading the field, even for the new hardware. At the PCW Show, CCI let the UK public see the new Commodore machine for the first time. Flying the Commodore flag in the main hall — with massive banner advertising its presence CCI with a "bank" the new 64Cs with games and other programs running on the sharp looking new Commodore computer while CBM itself chose to display AMIGAs in the "business" area.

Even before the PCW Show, when the news got out that CCI was to present the 64C, CCI was besieged by other magazines and the rest of the media wanting to find out how it was that CCI was about to give the public its first chance to get hands on the computer that many people think will leap to the leader in the home computer market come the end of the year, even before the official launch!

CCI's Managing Editor and Publisher, Antony Jacobson smiled enigmatically and pointed out that CCI had been the magazine to break the news in depth outside the US about the arrival of the machine. Though he refused to reveal how CCI had obtained the scoop then or where the new 64Cs were coming from for the PCW Show, he was quoted as saying that CCI's growing power as the leading international Commodore magazine made such developments inevitable.

The price of the new 64C is likely to be £199.00 in the UK which will make it conform with other European countries. In the US, the computer is selling for the usual Commodore parity — $199.00. In the UK it is almost certainly to be bundled with the exciting GEOS disk operating system (reviewed in CCI August/September), as it is in the US. This will be an important and possibly radical departure for the UK, as, unlike most other countries, disk based systems are greatly outnumbered by cassettes. Commodore's initiative could well lead to an upgrading of the whole UK home computer market.

cont

Dictionary of Computing. Collins - £1.95

What is 'breadboarding'? Yes, we've all heard of 'bubble memory' but what is it? If you've hurt your back, can you call a disk doctor or is that something that will find bugs in a program? The answers to these questions and much more can be found in what really is a valuable little gem, a 'Dictionary of Computing' published by Collins in their 'Gem' series.

It is pocket size and really astonishing value for £1.95 (in the UK) covering over 2000 terms and includes 45 useful diagrams.

The book is aimed at the non-science graduate buyer of today's computer, probably a micro, the user not the expert. Although it will certainly be of value to the student too.

Of course 2000 terms may not sound much compared to the huge number in the general dictionaries. However, considering the short history of computing and connected activities, there cannot be many that Ian Sinclair, an acknowledged authority on a wide range of computers including Commodores, could not have included.

The only omissions I could find were 'semi-conductor', which is strange, and my own personal weakness for 'Babbage' the name of one of the founders of computing. But of course, names are not strictly 'terms'. Even simple entries like 'NCR' in which he gives both the usual 'No Carbon Required' and 'National Cash Register' — the company that introduced the — are informative. When it comes to complex definitions, this excellent and easy to use dictionary is extremely helpful and a real aid in fighting a way through the growing jungle of jargon that afflicts anyone in the computer industry or who uses computers. Very highly recommended. By the way, did you know that an 'improper argument' usually leads to a 'fatal error'? Fascinating!

8th COMMODORE SHOW PREVIEW

The 8th official Commodore computer show

The 8th Official Commodore Show in Manchester, sees the official launch of the re-designed 64, the 64C. Although CCI are previewing this machine at the PCW show, the official launch will be at the Manchester exhibition.

The 64C will be displayed along with its re-designed peripherals, the 1541C disc-drive, and the 1802 monitor. Despite rumours to the contrary, the 64C WILL have GEOS, the WIMP (Window Icon Mouse) operating system bundled with it, providing the purchase with a friendly, easy to use icon driven front-end.

Many business products for the C128 and C128D will be displayed, proving once and for all that this machine CAN be used as a serious business machine. Similar products will also be on show for the Amiga and the Commodore PC series II.

As has been the case at all recent Commodore shows, there will be a Commodore Theatre, with frequent lectures, talks and demonstrations. Commodore themselves have a presentation every day, along with ICPUG (with Jack Cohen and Jim Kennedy) and Sophus who are just finishing their Amiga database KIM.

There is quite a heavy emphasis on telecommunications with Compunet, Micronet (sparks should fly there...) and Microlink all exhibiting, and no doubt all contradicting each other about the merits of their respectively excellent networks. Other exhibitors include Evesham Micros, Total Office, with their interesting new integrated package Adamsoft, and Computer Bookshops, so there is a wide spread of companies on display.

Compunet's stand should also be worth a look if you haven't seen it before. They are currently offering an incredible deal (see the Compunet article this issue); for £18.50 you get a modem, and a Gold subscription for three months. See the article for more information. Micronet will be showing their C64/128 network, which is very different to Compunet, and there is a lot of controversy over which is better. Make you mind up at the show!

Another interesting company at the show will be Colleen. Well regarded for their music package (see review September CCI) Colleen will be displaying this package with extra developments on stand 22. Colleen also contributed the payroll module of the Total Office's 128 and Amiga office compendium package (stands 27/28). Colleen have told CCI of a highly interesting, but still secret development which they say is 'revolutionary'. Their stand should be well worth a visit.

CCI of course will have a major presence at the show, especially as we are as usual creating and compiling the official Show Guide! At the CCI stand you'll be able to see all that's new, including some amazing products on the Amiga, hitherto unseen in the UK! We have been swamped by orders for dust-covers, and have completely run out, but don't worry; by the Show we'll have them in plentiful supply, along with other goodies such as sweatshirts and T-shirts! At the CCI stand you'll also be able to see a massive Bulletin 1000; the video-magazine showing the latest and hottest releases from all the best software companies. It all goes to make up the most exciting prospects for a Commodore Show ever in the UK outside of London. See you at the show!

Play Your Cards Right

Cumana Limited of Guildford, Surrey, the largest manufacturer of floppy disk drives in Europe, will be displaying a number of new disk drive developments at the 1986 PC World Exhibition on their Stand, No 2026 and also the Cumana Astron Card (see CCI July).

The Cumana Astron Card is similar in physical size and appearance to the average plastic credit card. However, inside the plastic casing is an integrated circuit which is connected to the 'outside world' by a series of thirty-eight pins. Because of its small size, very little space is needed for its interface — a significant convenience allowing equipment designers and manufacturers to produce even more compact hardware with significant savings in manufacturing costs.

The card can be programmed for almost any type of application and comes in four versions: ROM cards (including 'voice' cards); One-shot PROM cards (blank cards ready to be 'blown' by software suppliers); EEPROM cards (electronically alterable); and perhaps most exciting of all, high speed read/write RAM cards. The RAM card will eventually have a capacity of up to 1 Mbyte of CMOS RAM powered by a five year lithium battery — and will eventually replace both cassettes and the lower capacity disk drive in memory device storage media.

The interface and the vertical and horizontal connectors for Astron cards are easy to produce and low in cost and will be available on a range of microcomputers including IBM PC and Commodore.

Cumana disk drives are approved by BEAB to BS 415 and DMEE for electrical safety for use in GLC and ILEA establishments.

Birthday Boys

Level 9 Computing, widely regarded as the top UK adventure house, will be celebrating their 5th birthday at this years PCW show.

The Level 9 stand will take the form of a museum, with memorabilia dating back to 1981 when the company was started by the Austin brothers, Pete, Nick and Mike. They had just £50 and a Nascom kit computer. Now they sell over 100 different product lines worldwide, covering 11 home micros. See how Level 9 grew from a part-time hobby, with classified ads and typewritten cassette inlays, to become a major software producer in 1986.

How has hardware improved over 5 years? See for yourselves as Level 9 are going to enact a 'computer battle' between the Nascom computer of 1981 and the Amiga of 1986.

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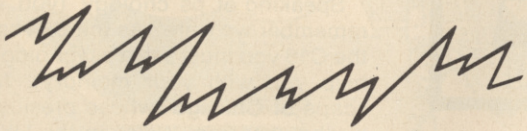

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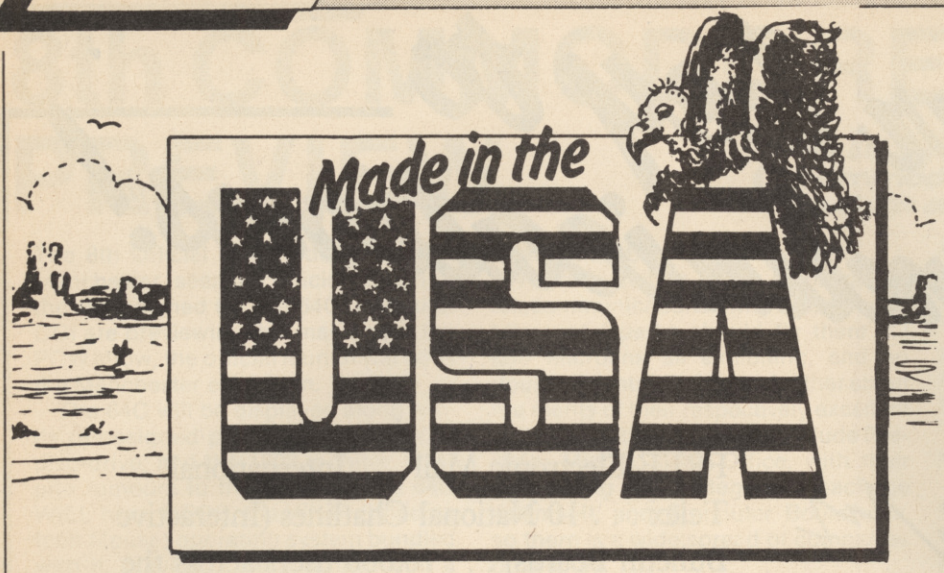

Made in the USA

As games and other software get brain-stretchingly more complex, my poor old bonce needs helping out. But help, I gurgle gleefully, is right at hand. The UK's Mastertronic US organisation has released a product called 'The Infinity Machine' which to quote Mastertronic's purple old prosé holds the secret of eternal life. Is that all?

Infinity Machine is a useful 'game killer' that disables sprite collison detection devices, which means, for those of you games playing computer dummies who like me didn't know what it was, that you don't get killed no more never. Just plug it into your 64/128 and live forever and a day. Infinity here you come! You should be so lucky for $24.99!

The new 64C that the wise money is betting will add another million or so to the 2.5 million C64's in the U.S. already pumping away at the heart of computerdom, is proving a hot seller. No wonder when it comes bundled with the punchy GEOS (Graphic Environment Operating System) from spunky Berkely Software Outfit. This GEOS baby is really something else. Not only does it give you the feeling that your 64 is coming on like the sexy AMIGA, windows and all, but the GEOS disk contains on one side the GEOS user interface, op. system and applications and on the other, 'jiminy cricket, step up folks and buy' there's the QuantumLink telecomms program. The whole darn shooting match hits your disk drive free gratis and for nothing the new 64C or you can grab it for your oldie but goodie 64 for just $59.95. Now that's what I call value. Especially as QuantumLink charge a flat $9.95 a month so you can forget muchos bucks per minute other on-line services cop you. El QuantumLink reaches out to 500 plus cities now for just a local call.

Sound Off

The personable, Lisa Rodgers of Tampa, Florida, is making no secret of the love of her life! What is Lisa's 'favourite peripheral'? Censor your dirty mind, choir boy! It is 'Ultravox' a sound system that is currently beating out a wall of sound (forgive me Mr Ramone!) Compatible with 64, 128 and Plus/4 or C16 it's a ready to go stereo system that powers your speakers direct or plugs into your home stereo. $69.95, it's enough to get any birdie singing 'cheap, cheap. You can toss in another $89.95, you'll build that sound wall even higher with Micro arts 64/128 sound sampler to send you endlessly looping etc, if that's what turns you round, Rockman. Other people, other fantasies... Me, I don't mind being me, except sometimes maybe say late Saturday night when the red and green lights of my faithful 1541 both jam on and it starts to whirr irritably... but I'll bet my new AMIGA against your old Vic that you and everyone you know including Uncle Bernie and Cousin Abigail and old man Porterhouse down the block... all sometimes climb into the fantasy skin of some other role playing adventure characters. And please don't tell me *your* specials! Phantasie from Strategic Simulations was certainly one of the most popular fantasy games ever for diving into someone else's id and ego and splashing about fantastically.

So what do we get after Phantasie? Yes, siree you got it in one or rather II. Phantasie II. As is the fashion, you can, as in the successful Bard's Tale and Ultimas, transfer your character from Phantasie I or you can start from scratch as a human or exotic, unearthly creature in your battle against that horror movie villain, the Dark Lord Nickodemus. I know apparently normal propeller heads who find Phantasie the *only* place to live. But then some people like their frankfurters covered with jelly... Yup, the games people play thanks to the late Eric Berne tell us something pretty clear about what they want from life (put down that pistol Momma, it may not be loaded!) which reminds me that recently I met a gorgeous 19 year old Mexican girl and trying to make an impression I told her I had a 64. A 64. 'It must be a beeg one...' she said wonderingly. 'I 'ave a '38. I keep it in the glove compartment of my automobile. There is mucho terrorismo in Mexico.' I decided not to ask her about an interface after all.

Speaking of ps chology (you don't remember we were? As the C64 said to the C16 you must see a psychologist to help you with your memory). Mindscape of Chicago (whose president is by the way from Wales in the UK and whose Press Relations chief Karen Novak is possibly the most charming in the software business. Hooray for nice, talented people!) have brought out a 64/128 version of their PC smash 'The Luscher Profile'. Just from looking at a few colours and shapes, you learn more about yourself than you'd want anyone else to know.

The news is good for the skibobbing crowd down at Aspen, Epyx is releasing Winter Games on the AMIGA. And you can look for 'Rogue' a onetime mainframe game to hit AMIGA screens shortly, courtesy of Epyx too.

Maybe the most unusual idea so far in '86 — something to literally, and I mean literally, grab you where you live is 'Grasp' Software. Produced by Shoredata and developed by VPL Research in Palo Alt, California, it is a visual programming language for the 64/128 that's operated by, I kid you not, a potential glove input device. "The glove feels and looks like any ordinary lightweight glove. When you wear the glove, you can 'handle' images on the screen as if they were real objects. Different from more conventional programming the 'grasp' programming language uses pictures, sounds and animations to produce visual, real time results. 'Grasp' will also let non-programmers modify glove-based programs or create their own original programming ideas."

Now, I've got to be honest. I haven't grasped in my own hot little mauler any one of the Shoredata special gloves yet. I'm quoting, like all great journalists do, exactly what the guys at Shoredata say it is. I'm getting one of these five fingered wonders if it's the last thing I do and you, my wide-eyed friends, shall be the very first to know how 'grasp' grabs little old Made in the USA' me. That's of course, it it doesn't turn my fingers toward me and move my hand slowly toward my throat and...

Joe Gene Parris

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Much has been written about the amazing capabilities of the Commodore 64. Probably even more has been written in the way of software to exploit these capabilities. It has been my fortune (good or otherwise) to have had a look at a fair number of them, ranging from the pretty good to the quite atrocious. All the ones that I've seen will enable you to draw pictures after a fashion but all have faults of one sort or another

Some are painfully slow to carry out the commands you give them. This is no particular problem when you are learning how to use the system but gets a bit frustrating when you are trying to use the program to produce a work of art — or even a little poster for the next event at the Village Hall.

Any new program is difficult to operate until you get used to it but I have seen Graphics packages that necessitate switching screens or ploughing through three or four menus to find the command you need at any given time. The commands are there — it's just a matter of finding them.

Many manuals for Graphics packages either treat the customer like an idiot or assume that he or she has been sitting on the programmer's shoulder throughout the writing of the program.

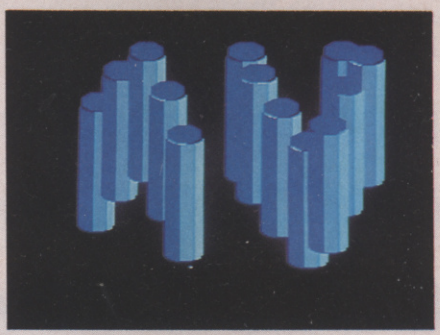
Control Devices

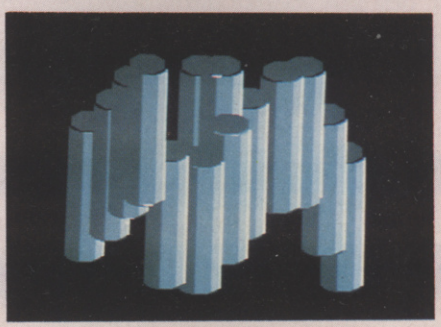
The versatility of a Graphics program is largely dependent on the amount of control that the user has over the cursor movement on screen. This in turn is usually governed by the method in which control is effected. There are six different ways to input information or instructions — keyboard, joystick, trackball, lightpen, digitising tablet or mouse. Of these, only the last three allow you to draw as if you were using a pencil (i.e. by moving your hand over a flat surface).

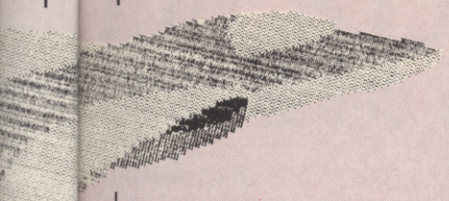
It is probably no coincidence that better minds than mine have decided that the mouse is the best way to input graphics information to a computer. Dedicated systems costing over £100,000 use mice. The Amiga uses a mouse.

Apples and Apricots have been using mice for years. My case rests.

Some time ago, I reviewed a little gadget called the Wigmore MS2000, a neat little mouse which came with a program rather cornily called 'Cheese'. At the time, I enthused about the mouse and the software but criticised the doc-



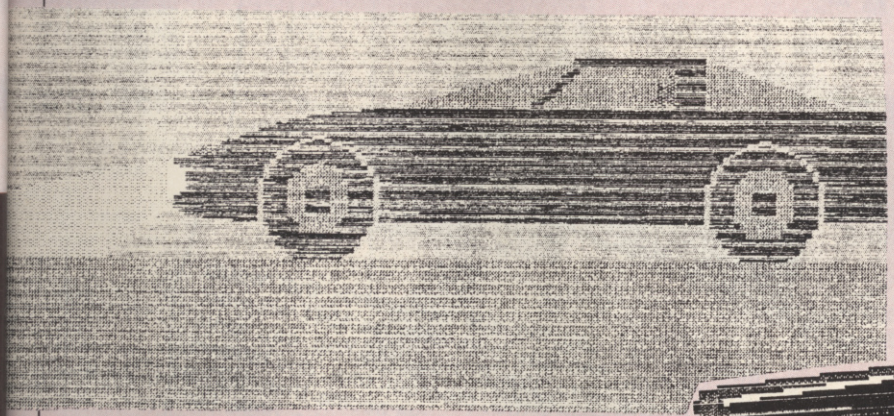




umentation. Little did I know that Wigmore were in the middle of producing another software package or that they would call my bluff and suggest that I put my word processor where my mouth was. My comments about ARTIST 64 will therefore be confined to the software itself — all I shall say about the manual is that it took a long time to write and my mum likes it.

Supplied on two discs (or tapes), ARTIST 64 makes full use of the mouse — unlike Cheese, which only used one of the two buttons available. The program itself is on one disc and the number of additional utilities are on the other. The package costs £34.90, and the mouse/Cheese combination another £39 (Wigmore say that they're going to be selling the mouse on its own at a reduced price (check before you buy). It's not cheap but, as with most things, you get what you pay for. It is possible to control the program with an ordinary joystick but it's rather unsatisfactory after using the real thing.

There are three menus to familiarise yourself with — the I/O Menu, which facilitates communication with disc drives, tape decks and printers; the Special Effects Menu, which allows patterns, sprites and other effects to be designed and used; and the Main Menu, which contains the main Drawing Instructions. A fourth menu is brought into use when the Record utility is loaded — this enables a sequence of operations to be recorded in RAM so that the computer can appear to be drawing by itself when the sequence is played back. The recorded sequences can be saved on disk and replayed at will, enabling some simple animation effects to be produced.



13 Commands

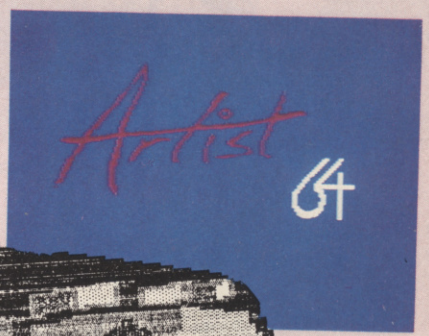
ARTIST 64 has 13 Commands, each of which can be affected by combinations of one or more Options (there are 21 of these) to give a total of more than a quarter of a million possible combinations of effects which can be used. Some of the combinations are pretty useless but there's still a lot that can be done.

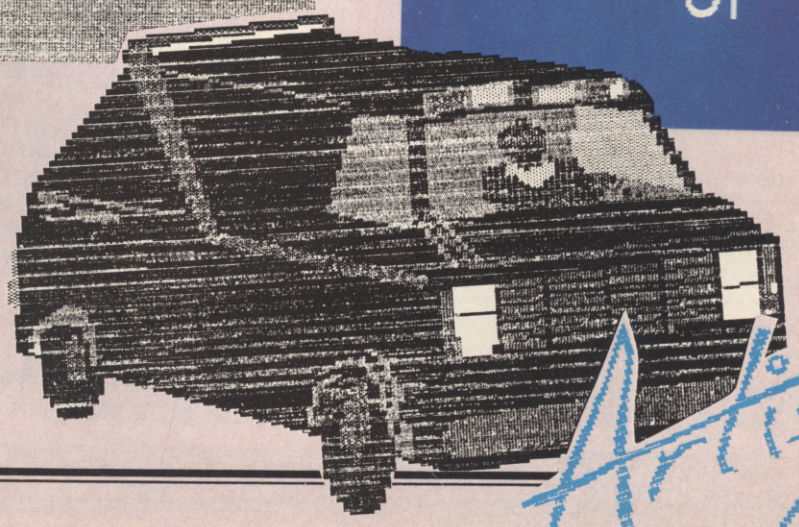
All the standard Commands are there — Line, Draw, Circle, Rectangle, Area Fill, Block Copy, Colour Swap etc. They all work quickly and efficiently but it's some of the extra features which make ARTIST 64 more than just another doodling device. One of my favourites was the 'Sprite' feature — any rectangular area of the screen can be defined as a sprite (not quite in the accepted sense of the expression but close enough to make little difference) and then reproduced at will in a variety of different ways.

ARTIST 64 operates in the Commodore 64's multicolour mode, so there are limitatioins on resolution and on the number of colours which can appear in a given area. It is a very sophisticated (and robust — I have yet to crash it) program which takes a while to master but it's worth the effort! Screen dumps can be performed either through the Serial Port or the User Port (for Centronics-type printers).

Notwithstanding my already declared interest in the program, I would heartily recommend it. As ever, I would advise anybody considering the investment to try to arrange a demonstration and/or trial run before parting with any cash.

Contact: Wigmore House Limited, 32 Savile Row, London W1X 1AG. Tel: 01-734 0173.





Artist 64
TONY LYDEARD

THE ENHANCER 2000

The Enhancer is a third party (non-Commodore made) disk drive for the C64. Although there have been others around for the 64, none of them as yet has been 1541 compatible, even though they've been around in the US for years now. It is interesting to note that although in the rest of Europe and North America, cassette drives are in a distinct minority, in the UK, only 30% of computer uses have disk drives. In the US cassettes are almost unheard of, but then software prices are around the $30 mark. The only explanation is that up until now, buying a disk drive has been a major expense, especially in the UK. With the arrival of the Enhancer at £115 + vat all that should change. I don't think I have seen a CBM compatible drive for the 64 at such a low price, even in the US, where at $170 the Enhancer is selling very fast indeed, with many people buying it in preference to Commodore's own 1541. It was built by Chinon a Japanese company well known for their high precision cameras.

The advantages of owning a disk drive are tremendous. No longer do you have to wait 15 minute for a program to load. The longest it should ever take with a disk is 2 minutes, and as with tapes there is a disk turbo. Turbos range from 4 fold speed increases to one German product that increases the speed by thirty-five, yes 35, times! This is a transfer rate of about 30k/second! Better programs are available on disks too. Being able to store data files on the disk, which has a capacity of 170k, means less need to be in ram at any one time, and so programs can be much larger and more complex, with graphics or even parts of the program being loaded off disk when necessary.

IMPROVEMENT

The Enhancer is a vast improvement over the rather dated and large brick, the 1541. It is a lot smaller, coloured in C64 brown with a black drive door area. When you first unpack the unit, the first thing that strikes you is the separate trasnformer; the 1541 has one built in, which does help considerably to enlarge it. It plugs straight into the C64 just like the 1541. There are however a few differences apart from size . . .

For a start, data transfer (loading, saving etc) is much faster; over twice as fast in fact. The Enhancer also comes bundled with a word processor called Masterwriter, a £50 icon driven program from the States. As with the 1541, there are two serial ports, so it is possible to daisy-chain drives or printers; the Enhancer doesn't mean the end of the line!

As you can see from the photo, the Enhancer is very nicely designed. It has a separate error light and busy light, so you know when there really is an error, and not just the drive whirring round. The disks are inserted in the normal way, and the drive door closed by pulling it down and clicking it into place. It opens by applying pressure downwards; rather like the 1541, but a lot more elegant.

All the disk commands that would normally work with the 1541 will work with the Enhancer. You can save sequential, program, user, and random file (and of course access them!). You can access the 2kram the drive has internally, and even use it for your own programs, as the Enhancer has a 6502 processor built in.

As you can see, the Enhancer has a very impressive specification. If you don't have a disk drive, and are looking for something to treat yourself to, get an Enhancer. **For £115 + vat it is very good indeed.**

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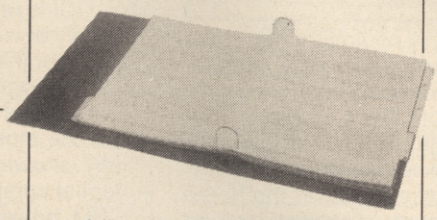

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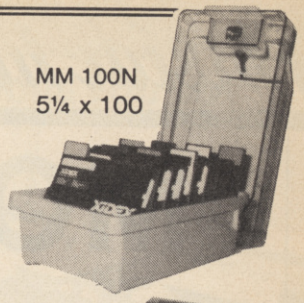

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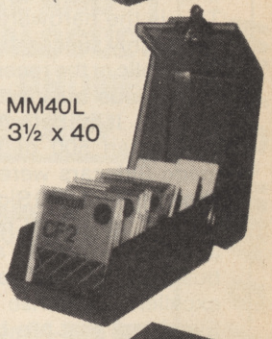

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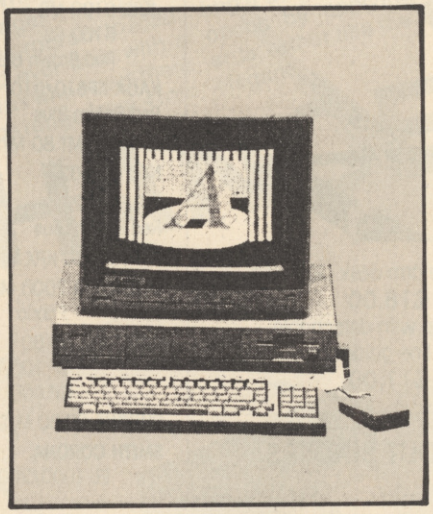
MORE AND MORE AMIGAS

The recent successful launch of the AMIGA outside the U.S, reputedly with stocks selling out almost at once, may have encouraged Commodore to bring forward plans to increase the range of AMIGAS. Reliable sources have revealed to CCI that a more powerful, higher up the range totally, business AMIGA, the 2500, codenamed 'Duo' is to be brought out in the U.S. before Christmas. It will have 2K of memory and, probably incorporating Sidecar. This is the hardware PC emulator that was highly successful in convincing the UK public at the recent PC User Show of the serious business credibility of the AMIGA. It is believed that orders for more than 500 of the West German made Sidecars were taken at that one show alone. 1,000 Sidecars have gone to the US for official regulatory approval and already caused a notable stir in the business field. UK dealers are reporting excellent response from the "Open Evenings" that are being organised to show potential buyers the excitement that the AMIGA generates. CCI had heard 10% of visitors are purchasing — a very high conversion rate. From countries like West Germany and Denmark CCI has received reports of immediate sales success.

Chris Kaday, Commodore UK's General Manager, told CCI that the new AMIGA would give even more power to the range and he confirmed the excellent response that dealers were receiving for the present AMIGAS. Commodore UK is trying to defend dealers from price cutting — which is not popular through as in any competitive market likely to occur.

512K AMIGAS, in the UK, can now be bought officially at £1,399 and leased for around £11.50 per week. Will the prices fall further? Commodore does not see that as probable. The AMIGA is very good value at present prices, is the official line. However, cheaper 'grey imports' — machines brought into the country without official approval — are reaching the UK. Commodore UK has firmly pointed out that though these are genuine 256K AMIGAS, they may not conform to UK standards and like all computers taken to other countries are not covered by local warranties. In its enquiries into AMIGA developments, CCI discovered that there many be another very interesting AMIGA on the perhaps not quite so close horizon — a down market AMIGA. CCI can exclusively reveal that Commodore is planning an AMIGA that will spearhead an attack on an entirely different market from that of the present AMIGAS — the true home entertainment sector. While internationally, Commodore officially denies it, CCI sources in the US told us that the 'cheap' AMIGA may be sold without monitor or drive and in a 128/64C style box. The stripped down 'home' AMIGA could sell for well under $1,000 (versus $1,500 at present in the US) perhaps even as low as $500-$700. This would bring it — successfully many believe — into direct competition with the Atari ST which at present dominates the lower range of 6,000 chip market.



Such an AMIGA could fill a gap in the AMIGA range and play a very interesting role in the developing strategy for the marketing of CBM's products. The power of the AMIGA allied to a low price — even with a lower than present specification could take by storm the home market which seems at present looking for a new computer to catch its imagination. It would also nullify the changes of non-compatibility often levelled at the AMIGA. Virtually all home computers are non-compatible anyway. The 'home' AMIGA at about £500 might be a little but not excessively expensive — and would just be one among many incompatible systems. But with an AMIGA with its graphic creativity, music making, game playing power...

In CCI's investigation, we encountered a refusal to be believe that Commodore could even produce on AMIGA at such a price. Howeverm the idea of a mass market AMIGA seems to have gone down very well with Commodore's patient but somewhat worried bankers on Wall Street. They see the AMIGA as an as yet, unfulfilled promise and appear to be withholding final arrangements for the finance that Commodore needs until the results of the sales of AMIGA become clearer.

A 'home level' AMIGA is thought to have received their approval and is certainly an exciting idea for everyone in the Commodore world. It would provide a useful counter to the growing stories of the discontinuane of sales of the 128. While Commodore denies that it is stopping production of 128's, it has been confirmed to CCI that the 128 has been selling in the UK at £169.00 and some major chain stores are not likely to re-stock when supplies are sold out. They see the 128D as a more interesting alternative for small business an the 'designer label' style 64C as the home market seller. In consequence, the 128 may be being squeezed out.

Could a 256K stripped down, low price AMIGA developed for home user not take the place of the 128? At present price levels, it may be difficult to imagine but informed observers of the Commodore — and overall computer scene — consider that 256K may well be the route that the home computing will in any case take and CBM could, as it has in the past, lead the field into that new territory. CCI is reliably informed that CBM is rapidly developing such a project and none other than Irving Gould, President of Commodore, has put his considerable weight behind it. The end of the year looks the most likely date for the first public showing of this exciting, high potential computer.

CBM, however, may have other plans too. A totally new AMIGA with new chips and some other surprises is already under consideration. While refusing to comment on the details of the reported AMIGAS, Chris Kaday told CCI "we have always said that the AMIGA is not just one computer but a range of computers. The most exciting yet developed. There is much more to come!"

Commodore may have its problems, but it certainly keeps making life interesting.

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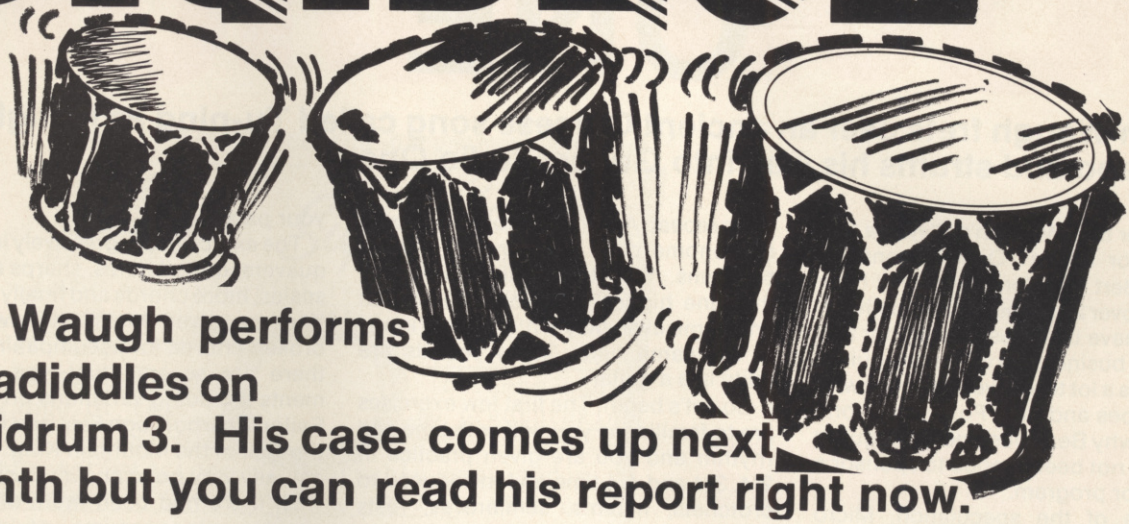
Feature

DIGIDRUM



Ian Waugh performs Paradiddles on Digidrum 3. His case comes up next month but you can read his report right now.

You can't say we're not thorough. We ardently reviewed the original Digidrum and then Digidrum 2 (December 1985). Now that Tron have gone one better with Digidrum 3 we can see no reason why we souldn't take a look at this one, too. The hardware is basically the same — only the software has been updated. For those who missed the other reviews (shame on you), a bit of background.

The Digidrum is a computer controlled drum unit. The hardware consists of a smal digital-to-analogue converter which plugs into the User Port. It has a jack socket for audio out and a phono socket for a trigger out. This produces a one pulse per step output to help control sequencers and other equipment.

The hard work, however, is done by clever software. The Digidrum uses sampled sounds of real drums which are stored on disc and then loaded into memory when required. The standard set consists of eight drum sounds which are inserted into a rhythm pattern by pressing their associated letter: C (Crash cymbal); O (Open hihat); H (Closed hihat); D (Drum, small tom); S (Snare); G (Grand tom); F (Floor tom) and B (Bass drum). Irregular perhaps but you soon get used to it. The pattern is displayed on screen in a grid and the initial letters are shown on the right. When you press a key a strange graphics character appears to show the drum's position in the pattern. Up to three drums can sound at once but some are mutually exclusive, for example you can't sound the cymbals together.

Each pattern can have up to 38 steps and the program can hold up to 51 patterns. A Song or drum track is built up by chaining together the patterns. Each song can hold up to 100 steps and each step will play a pattern a certain number of times. For example, you may want an intro (say pattern 6) and then a basic rhythm (say pattern 2) for 8 bars. You would press P to tell the program you want to enter a pattern then enter 6,1 and press RETURN; press P again then enter 2,8 and press RETURN. Dedicated drum machines use this method of programming patterns and chaining them together. It's natural and easy to use.

You can move around the pattern and song screens with the cursor keys and editing them both is very easy. Up to 10 songs can be held in memory at any one time and new patterns and songs can be loaded in around 10 seconds — more than fast enough for live use.

But what does it sound like? Well, if you'd read the other reviews you would know that the sampled sounds are pretty terrific. They compare well with and in some cases are even better than many machines at the lower end of the dedicated drum unit market.

Where the Digidrum really comes into its own, however, is in its ability to load new sounds from samples stored on disc. So if, in your inestimable wisdom, you think the hihat has a bit too much sizz and not enough ring you can substitute one with just the right amounts of this and that.

There are already three discs of new sounds available, each holding around 40 drum sounds. The systems disc has Glass, Latin and Syn drum sounds. Soundset V1 contains full sets of Cowbells, Toms and Tims, Pitchbend Toms and Hihats and Cymbals. V2 h as another Standard Set, another Latin set, a Crow set (Latin and some weird instruments but super sounds) and a Bass line. Soundset V3 has full kits of Hihats, Pitchbend Toms and Funny Effects.

Each disc also contains many single sounds which can be loaded into individual drums so you can build up customised kits, tailor made to suit each song. Each disc costs £17.99 and a cassette of V2 and V3 costs £29.99.

The main *raison d'etre* for a third version of the Digidrum is the new Sound Editor. This is loaded from a new menu option and it lets you swap sounds, copy them and even mix them — more ways to devise your perfect cymbal. You can also alter envelopes and volume levels. The manual has only scant information about the Sound Editor and more is required but this is in the works.

If owners of Digidrum 2 find all this attractive they can update their software for £17.99 (£14.99 on cassette).

New products to support further the Digidrum are continually being developed. MIDI software and hardware will permit the Digidrum to be controlled from an external MIDI system and a set of trigger switches will let you trigger the drum sounds individually. Tron are also working towards making samplers compatible with the Digidrum so you may soon be able to sample and load in your own sounds.

At £79.99 (including VAT and UK Postage and Packing), Tron's Digidrum turns your Commodore into a sophisticated drum machine, ideal for home recording and even for use on stage. And don't let the price fool you — it produces some terrific sounds. You can prove this for yourself because an audio cassette demo is now available for £2.99, refundable with an order. It's worth listening to even if you eventually don't buy a machined but Tron reckon you'll be sold. So do I.

More information from Syndromic Music, 24-26 Avenue Mews, Muswell Hill, London N10 2NP. Tel: 01-883 1333.

Feature

GUITAR STUDIO ONE

— Ian Waugh frets over an ancient Chinese song called Tu-ning as he tightens his capo and strums his way into Guitar Studio One.

Remember Bert Weedon's *Play in a Day* guitar tutor books? Does anyone remember Bert Weedon? (you may have to be well over 25 to answer affirmatively.) He must have been responsible for half the music business taking up the guitar; yes, he has a lot to answer for. What with Geoff Capes and Sam Fox games, one wonders why Bert (or some other guitar guru) has not been tapped to sponsor a guitar tutor program.

Enough of the speculation, Micro Melody have gone it alone with a series of programs written specially for guitarists. They have three Guitar Studio programs called Guitar Studio One, Guitar Studio Two and, yes you guessed, Guitar Studio Three. Studio One is for absolute beginners both to music and to the guitar and this is the program which I looked at — perhaps someone is trying to tell me something.

The package consists of a disk or cassette and an A4 46-page ring-bound manual. One of the major problems with computer based tutorials is that lack of memory severely restricts the amount of information which can be presented. A manual can overcome this problem by filling in the gaps. In Studio One the program and the manual are used side by side.

The disk version of the program loads in just over a minute and while it's loading you can read the introduction which begins by describing the guitar and how to tune it. The course is divided, sensibly, into exercises. Each exercise is represented on the computer as a page and there are 119 in all. (Page 120 is the tune up page.) From the index page you can go to any exercise page.

There are four types of exercise: music screens, chord practice, chord sequences and note tests. Each page has similar controls as far as possible. For example, you can move forwards or backwards to the next or previous page or call up the index page. The exercises which play music have a tempo control and let you alter the sound produced by the SID chip. There are 26 different settings and this is very useful for several reasons. First of all, changing the sound helps break the monotony of repeated exercises. Secondly, some of the options automatically change voice as the exercises repeat. Another option produces a metronome click to help with rhythm problems. Yet other options will play the tune higher or lower than written and some even play it higher *and* lower at the same time. Some sounds are quite like a guitar.

So, let's begin. The first few exercises are to familiarise yourself with time and rhythm and you are given practice in 2/4, 3/4 and 4/4 time and introduced to crotchets, minims, semibreves, rests and ties. These are basically clapping exercises — without the guitar — and you can slow down the tempo until you master them. My only criticism is that the beats are not accented so for example, instead of a loud one followed by a quiet two, three, all beats are at the same volume level. Accented beats would help pupils with rhythm problems but none of the exercises are terribly complicated. Once you can clap four in a bar, note names are introduced and you finally pick up the guitar and play a few notes.

All of the music examples appear in the manual and most are also shown on screen. The computer plays them so you know what they should sound like and a pointer points to the notes as they play. If you use the metronome option it will also keep time so the examples are really very easy to follow.

One of the most exciting features of the program is the duets. Lots of the exercises can be played as a duet with other exercises so you can play one part while the computer plays the other. This can really help take the drudge out of practice sessions and, unlike a human tutor, the computer never gets bored and will play the piece at whatever speed you want and with a variety of sounds.

When you reach exercise 24 you're playing simple tunes, tunes well-remembered from days at school playing the recorder.

Exercise 35 introduces chords and now you can accompany melodies which the computer will play. About this time you are also given a note checker test which makes sure ytou know the names of the notes encountered so far. Each run produces a new arrangement of notes so it really puts your through your paces.

The exercises progressively introduce quavers, dotted notes, sharps and flats, scales, more chords and finally 6/8 time. You are given hints on how to use broken chords for accompaniment and there are several duet-type arrangements including variations on Drunken Sailor, Scarborough Fair, and Grieg's In the Hall of the Mountain King. They are actually very good and interesting and I wish there had been more of them. A supplementary course of additional exercises is or will soon be available, however.

Starting to learn a new instrument is a crucial time. If results are not immediately forthcoming it can be difficult to sustain interest. Studio One helps overcome some of the initial starting problems by presenting exercises which are as interesting as possible within the limitations of a beginner's musical ability. Even when you're struggling at Yanky Doodle level there are duets to play which are far more interesting and losts more fun than making a mess of things on your own. The computer has really been used to good advantage, not just as a computerised list of instructions. The program should suit adults and children equally.

Once you can bash out a few chords, Micro Melody hope you will be interested in their Guitar Studio Two which gives you 500 more chords to practice and Studio Three which is all about music theory for guitarists.

So how much is all this you may wonder. Each studio costs £11.95 on disc and £9.95 on cassette. Excellent value and more interesting than Bert's books any day. But then, he didn't have a computer to help him.

Ian Waugh

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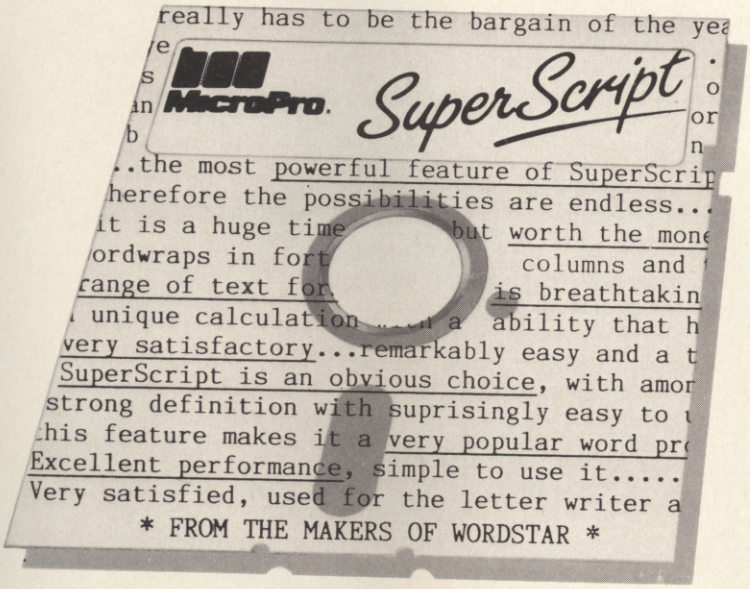

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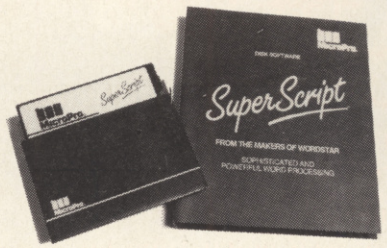

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Feature

SOUND EDITING — MICROVOX

No, I'm not going to make any remarks about samplers being N-N-N-Nineteen to the dozen...

A number of companies are producing keyboards with built-in sampling facilities but the Microvox Digital Sound Editor (to give it its full title) is based squarely arond the computer. The unit itself is housed in a metal case and a ribbon cable with a cartridge connector on one end connects the sampler to the Commodore's cartridge port. There are MIDI IN and MIDI OUT sockets at the back and the samples can be played from a MIDI keyboard or drum machine. The software is on disc but a cartridge based Pro version is also available with a few more features.

The software has been excellently designed and is a pleasure to use. Most options are selected using only the function keys but joystick control is possible. The program sections are divided into pages — like the big machines — and the main menu lists 9 options: Sound Sampler, Waveform Editor, Voice Handler, Playback, Sequencer, Keyboard Assigner, Special Effects, MIDI Controller and Disc Handler. We'll start at the top and work our way through them.

Sampling is easy. You plug into the input socket and play the sound. There are eight sampling rates ranging from a maximum of 17.92 seconds at 1KHz to 0.853 seconds at 20KHz (there's nothing like precision). The times decrease as the memory fills with samples and the Pro cartridge offers slightly longer times. The higher the rate the more memory it uses but the better the sound quality. You have to do your sums, use your ears and select the best rate for the sound.

At 1KHz the quality is noticeably poor but good samples can still be made at the lower rates and the overall sound quality is very good. A sample is taken when the volume of the input passes a predetermined threshold level. You can switch in a compander to reduce noise and filter the sounds to eliminate aliasing (ringing).

I sampled our dog's bark and played it back to him and he went crackers. Very unfair I know so I stopped. No RSPCA calls, please. I also sampled myself calling his name and when I played it back at different pitches he obviously thought his home was turning into a mad house. On the more musical side I produced some high quality orchestral stabs — trite now in the world of sampling, I know, but very effective all the same. And great fun! The disc includes some impressive drum samples and a demo rhythm pattern.

The Waveform Editor is a feature obviously missing from keyboard-based samplers. It produces a graphic display of the sample which you can edit in a variety of ways by moving coloured flags around. For example, you can select start and end positions and produce loops. Glitch-free loops are notoriously difficult to produce and the Pro cartridge has an Auto Looping Tool to help. It does a search through the wave until it thinks it has found a perfect loop. You can listen to it and if you don't like it it will search for another. You can reflect, invert and generally shift bits of the wave from one part to another. Fascinating stuff!

The Microvox can store up to 16 sounds at once and the Voice Handler helps organise these. You can name each sample which is a nice touch. You can add samples together, copy them and rename them. You can also save individual voices or all 16. The Pro cartridge lets you listen to the currently selected voice, fine tune it and adjust its volume.

Playback lets you play the samples from the QWERTY keys. The layout is compatible with the Music Maker clip on keyboard. This is useful it you don't have a MIDI keyboard or can't be bothered to connect it.

The Sequencer, which is not available on the Pro version, will be the centre of many users operations. It lets you program up to 24 patterns and chain them together to create a song. If you've programmed a drum machine, the procedure will be familiar to you. A pattern consists of 96 steps which are shown on a grid and music is generally limited to 4/4 time. Because 96 steps is too large to fit on the screen the grid scrolls as you move across it. You enter the voice you wish to sound, the octave and note and whether it is to be played in reverse. Patterns can be programmed in real- or step-time and edited in step-time.

The Pattern Chainer is where you string the patterns together to form a song.

The sequencer is controlled by a clock which can be either internal, external (via the Commodore's User Port) or from a MIDI clock connected to the MIDI IN socket. Details of the external clock, the manual says, are to be found in Appendix C which the manual did not have but no doubt Supersoft will inform interested users of the details if you ask. The tempo is variable from 1 to 99.

The Keyboard Assigner lets you assign a particular voice sounding at a present pitch to any key on the keyboard. You can use this to set up drum kit sounds and split keyboard effects.

The Special Effects is limited to a Digital Delay which works not on the stored samples but on signals coming into the unit. The delay can be varied, depending upon the available memory and the repeat control on the box determines the number of echoes. The Pro cartridge, however, adds other effects including harmonising, phasing, flanging and modulation and the Pro manual gives settings for a dozen such effects.

The MIDI Controller sets up the MIDI implementation and works in two modes. In MIDI mode 2 (omni on/mono) the voice and pitch are determined by the Keyboard Assigner. In mode 4 (omni off/mono) the pitch is determined by the key pressed and the voice by the channel number. Voice A is triggered by channel 1, voice B by channel 2, etc. You can therefore choose how you wish to use the samples. The Pro cartridge adds velocity sensitivity to the MIDI control. The samples can only be played monophonically.

The MIDI OUT socket has no use and the manual says it is for future expansion. But what? I wonder.

The final page is the Disc Handler from which you load files (they are saved from other pages). It also has a format option which should be obligatory in all good software packages.

The manual consisted of photocopied A4 sheets and is very well written and easy to understand. I would have wished for something more substantial in a package for this price but we should be thankful it's a good as it is — so many are photocopied *and* badly-written, too.

The standard Microvox costs £229.95 and the Pro version an extra £70. It is altogether a rather super package which brings quality sampling and comprehensive editing facilities within the reach of home and semi-pro musicians. I wouldn't be surprised if it found its way into a few studios, too. C-C-C-Can I keep it, Supersoft?

Ian Waugh

Contact:
Supersoft,
Winchester House,
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Happy as Larry

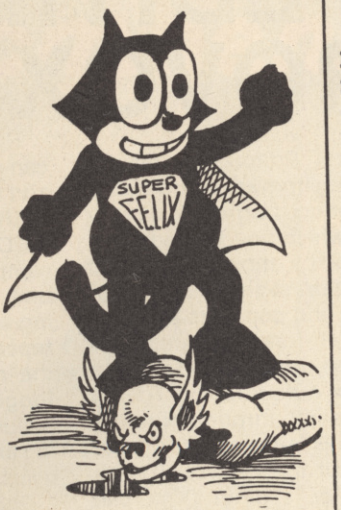
A strange seven feet six inch dwarf visited our office claiming to be the great-grandson of Rudolf Hess on a peace mission. He declared he'd parachuted from a zeppelin airship based in Ludlow. He also swore shyly that his name was Larry Giddon and he was 'intimately' associated with a certain Mr Right. As I said to him all of us girls look for Mr Right but never seem to be so lucky as Larry in finding him. Larry, reeking of Chanel No 99, whispered that he was boosting Sanxions – a game that has been condemned by Mrs Thatcher and President Reagan as obscene, non-productive and likely to put all the Whites in South Africa out of a job (sob!).

We were very sorry for poor Larry who seems to be deeply depressed by the politicians and his recent 9 month gestation period in which he was learning parenthood in exile in Ludlow.

He originally thought of joining his great-grandfather in Spandau Prison but decided instead to found a soft lollipop company called Thanatos – a Greek term for being beaten to death with fluffy lollipop sticks. Sanxions (not as one computer magazine called it, 'Finnblast') should sell well. We're told it's extremely playable and US Gold have paid half the 50 billion dollars they made in the first 6 months of 1986 just to distribute it. Dear Larry Giddon, such a sweet boy and so lucky. It's straight out of True Romance, isn't it? He found Mr Right and riches too (sniff sniff).

'Demons' precocious star Lilo Manless captured in lyrical vein (and we do mean vein . . .)

THE DEMONS OF LUDLOW



Demons and Ludlow

A young and sensitive member of CCI's team of thousands of brilliant writers and artists who work tirelessly and virtually without payment — except for a few measly thousands of pounds each week, in a moment or two of relaxation (get on with this story! Ed), entered the 'adult' section of a seedy video shop in a rundown inner urban area of Suffolk. What do you think (shock! horror!) he found there (under plain cover of course)? A cassette labelled (I kid you not!) 'Demons of Ludlow!! Unable to resist such low temptations, he hurried furtively home to view it. Without telling his Mum! What tremblingly he saw was billed as a 'Horror Movie' but so amateurish, stupid and all round rubbish was it that he fell about laughing with such hysteria that he damaged his larynx and writing hand.

He is now whispering bewilderedly about the terrible state of a certain magazine company whose name I cannot quite catch, that is forced to try to corrupt the public first with comics, then with nasty fluff covered lollipops and now with awful videos. Shame, shame on them.

Please avoid 'Demons of Ludlow' if you possibly can. The results, as you have read, can be terrible.

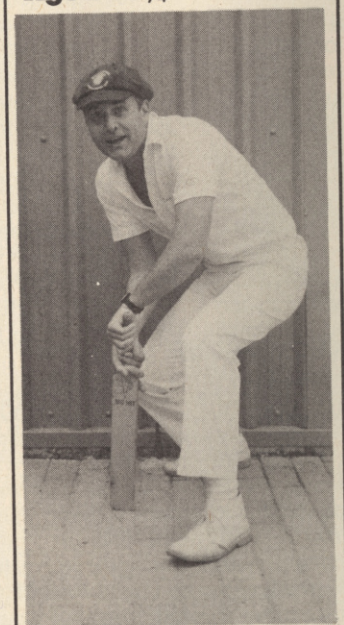
Getting into the habit

Marketing supremo Jane Smith has departed Argus amid rumours that she firmly refused to consider taking over the presently vacant MD's job. She has moved to join ex-Argus Marketing Director, gorgeous businesswoman of the year Jane Cavanagh at BT (Rainbird, Firebird, Beyond, Odin etc). The two Janes are set to conquer the world with BT's export drive gathering force.

Beauteous ex-nun Jane Smith is reported to be the outstanding matchmaker in the software world using her experience as erstwhile Mother Superior to pair off everyone at the caviar and champagne flooded leaving party that Argus threw for her at Claridges. It seems that most guests thought that the party should continue over the whole weekend, occupying most of the rooms in the hotel at Argus's generous expense. The eligible Michael Boxter of Solutions PR was so smitten with his Jane-appointed partner that his eligibility seems permanently compromised — a week after the party he still hadn't resurfaced.

Jane Smith, purity shining from the curves showing through her daringly cut nun's habit, is reputed to be losing a little of her religious fervour and innocence, First there are stories of a dewy-eyed romance with the grandson of billionaire ex-US Senator David Rockerfeller and now that she is conducting in-depth research into the peculiar (some would say perverted!) mating habits (no relation) of the software industry. Jane assures me that nothing will stand in her way 'to gain deep personal insight into this fascinating and important subject': Oh do be careful, Janey Waney. Please don't get as sullied, corrupted and debauched as the rest of us . . .

The Secret Diary of Adrian Smithson, Aged 48¾



Author of the downfall of English cricket. Note the designer cricket shoes (owing more to Dr Frankenstein than Dr Marten), used only amongst Elite (no relation . . .)

Marble Balls!

I am furious that I was not allowed to see the AMIGA version of Marble Madness. That awful midget, tiny Julie Rosen wormed her way under the door into the Bulgarian Embassy which I can reveal was where she and this mysterious A.N. Other (I hope they stuck a poisoned umbrella into him!) saw the so called 'game.'

Anyway, everyone knows that in my previous persona as Frankie Kafka, I invented the game, and I wrote the new version for the AMIGA too. And I smuggled it into the Bulgarian Embassy. And I own the world rights and I blew up Chernobyl. Stop! . . . Put me down. I don't want to wear that stiff white jacket. I want to write for a computer magazine, I am the Count of Duvalle . . . I will tell my friend Marie Antoinette le Carré! I will have you all guillotined. Marble Madness! You must be crazy!

...ullinat paper bag over your head! He knows who you are! And why!

Vive l'AMIGA

My editor returned from the recent PC User show very tired and emotional indeed. It seems that the AMIGA is now so famous that the French have decided to change the name of their trendy Beaujolais Nouveau to AMIGA Nouveau. I have to confess I find it hard to understand let alone believe my editor in a tired and emotional state.

So speaking French perfectly, of course, I telephoned President Mitterand. He confirmed to me that it was indeed 'trés vrai'. The AMIGA has been made de rigeur for all Wine Chateaux and this Autumn it will aid in harvesting their grapes and will star at the Moulin Rouge Night Club doing the Can-Can (or Bouteille-Bouteille as it's called in Paris, France). Nothing else but AMIGA Nouveau will be drunk at the Elysée Palace, or on the Cote d'Azur, and Bridget Bardot is to make a comeback film in which she is to play l'AMIGA.

In gratitude for his services to world computing and French wine, Mr Christopher Kaday, Commodore Supremo UK, is to be made Chevalier du Vin and his picture will fly on a flag from the Eiffel Tower up to 1990, or until Commodore takes over the world, whichever is sooner. It seems Chevalier Kaday has quite a reputation for pushing the boat out. We heard that at the PC show he downed no less than 500 Sidecars. When I told President Mitterand this he simply said 'Sacré Bleu!' Not since Hemingway at the Crillon 'ave I known such un homme'. As the Romans would have said 'Cave Canem (Cave Canem, that means watch out for dogs! Ed). Sorry, Ave Salute Mortuis Chevalier Kaday. We toast you in (hic) AMIGA nouveau. (Perhaps Commodore should advertise in 'The Winemaker'. Give him a call, Pierre Chandlair).

Silence in Court

We hear that slinky Pat Bitton of Mirrosoft is being hauled up in court. General Patton – sorry, General Bitton – has not committed any graver crime than masterminding the successful military assault on the charts of Biggles(or as they call him in Germany – 'Beagles'!).

No, glamorous Pat (is it true that she is to star in Beagles II?) has been requested to act as judge and jury in a forthcoming trial of a foreign spy called Cy Kombat. He is accused of trying to drain a European Micropool and filling it with some secret material called 'Rushwähr'. We also hear that Neil Dixon, star of the first Beagles film is pining away 'cos Mirrorstar Patty has been seen around with not one but *two* older men. These unknown aristocratic gents bear close resemblances to Lord Maxwell of the Commonwealth Games and Lord (Bonkers) Hailsham, the Lord Chancellor no less. When we informed Neil Beagles Dixon exactly who was helping Patty Watty's legal career, he mumbled something about leaping from a helicopter into the Maxwell House Coffee stall. We do hope he uses a parachute.

Royal Occasion

CCI was recently honoured by a visit from the legendary Courtney King — a very rare happening indeed. Mr King, sir, as we all call him, is recognised as the uncrowned world sovereign of the C16 and everything connected with it. He is amazingly reputed to play no less than 12 of these highly complex machines at the same time! Mr King, sir, does most of CCI's massive coverage of the C16 from his palatial residence deep in the heart of wild Hampshire (UK).

Mr King, sir, very rarely allows CCI or anyone else to be in contact with him. Though apparently isolated he knows everything, is aware and fully informed of even the slightest item of interest internationally on the C16 scene.

Many people believe that it's he who really controls the strange C16 world, telling software houses when and what to create and release. What is certain that since he became involved the C16 has shot to popularity and is now taking more than 10% of the total games software sold. Does anyone believe that could have happened for any other reason?

His hush-hush visit to CCI House caused a sensation. Besides the crowds of raving girls outside who had somehow learned about it, all 150 plus members of the feminine sex who are part of the CCI team stopped work in unison and just gazed in awe at his charismatic masculinity. "Wow Factor 11" was how Dry Fly Sherri, CCI's sophisticated production Princess described him.

None of us puny men dared even raise our eyes as Mr King, sir, passed. Do you know that it is generally believed that when he plays just one C16 game, he does not bother to touch the joystick at all but is able to move it with a mere stare of what Dry Fly Sherri sighingly described as "Those unbelievably sexy peepers".

We did furtively glance at Mr King, sir's knockout of a sister who accompanied him. A stunning "Miss Jamaica 1985", she is regarded as the most brilliant student of sociology that London's universities have ever seen while at the same time running a nationwide, hugely successful gambling syndicate.

Of course the biggest mystery of the mysterious Mr King, sir, is "Why the C16?" We have to confess none of us has ever dared to ask.

Big Slur

My editor is spitting mad (someone please lend us an umbrella!). I was stupid enough to show him another Commodore mag that has redesigned its front page and copied almost exactly our 'Commodore' style logo and even colour!

He stormed off to our lawyers Snatchit, Grabbit and Run (no relation) and demanded they sue somebody, anybody, everybody. Especially anybody with the initials S J or the word Abuser in the title, and all of the publishing businesses in London EC1 plus the population of Sweden who supplied the paper for 'this foul slur on the decency of the human race' as he gently put it.

I can't see what he's got so uptight about. After all imitation is the sincerest form of flattery isn't it (I wish I knew what that meant). Perhaps the lovely leopard skin leotard clad SJ will explain to me over breakfast – again.

mini-bus

A Birth is Announced

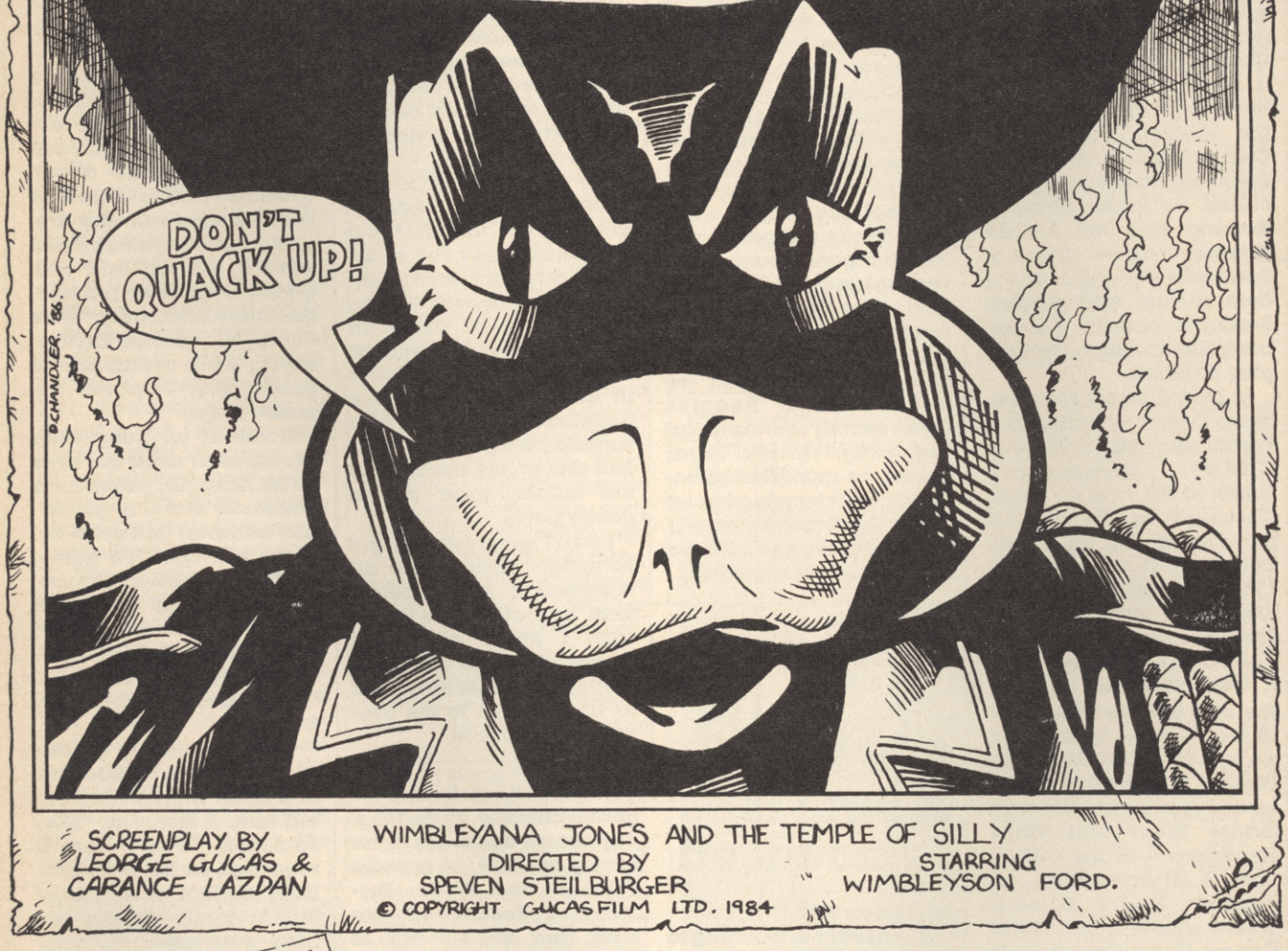
Isn't he sweet?

Bubble Bus is listening to the sound of little pattering tyres. The proud parent has blushingly told me of the birth of a little one: Mini-Bus. Long time successful games software house, Bubble Bus has created a special teenyweeny vehicle for a budget label. At £2.99, Mini buses will soon be voyaging all over the known games universe. Beep-Beep! Two recent additions to the family are C16/+4 gamers Trizons and Tazz. Brr-zoom . . . Yes indeedy, we hear that Bubble Bus is really getting hooked into infancy. Their latest Trizon game was programmed by Richard Clark who was all of 17 when he wrote it. Makes even London policemen looked aged. Help mummy, this big boy is shooting me up! Beep Beep! Br-zoom. Brrm. Crash!

Adios, Amigos!
Felix

You've seen the film! You've read the book!

Now play the game!



SCREENPLAY BY LEORGE GUCAS & CARANCE LAZDAN

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PREVIEW

Sanxion from Thalamus

Although it looks like a simple shoot 'em up, it is highly complex in strategy, and very difficult! The game seems to take the best bits from a mixed bag of arcade games and combines them to form a really great shoot 'em up. CCI saw Sanxion in an unfinished form, so the final product ought to be really special! Rob Hubbard (whadd'ya mean, "whose he?"!) wrote the music, and David Whittaker the sound effects. They were not incorporated in the version we saw, but between the two of them, their sound ought to be pretty hot!

The game is due for release on October 6th, although it will be on demo at various stands at the PCW show in September. As a first release I don't see how it can fail, and providing the rest of Thalamus' products maintains this standard, they look all set for some chart hoppers!

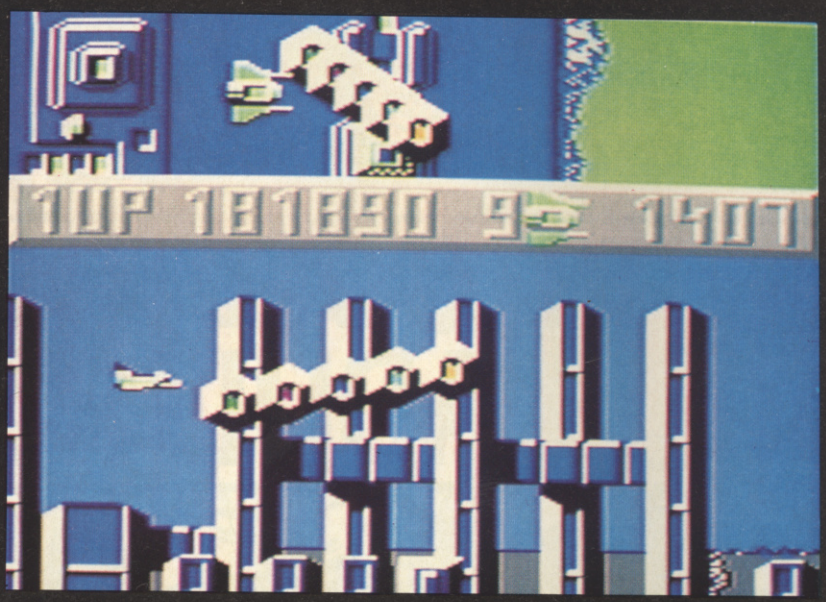
After many development names, the title for Thalamus' first game has finally been decided. Called Sanxion, it is to be their first release, though one of many, they hope, in the months to come. Andrew W, right, ex Press Officer from Activision is in charge of the new software house, and Gary Liddon ex of Newsfield is his technical executive.

Sanxion first saw the light of day at the Commodore Show, when the programer came along with his unfinished game hoping to interest someone. After playing it, Newsfield, who are Thalamus' backers, decided to market it.

Sanxion is massive. It gobbles up 60k, has 10 waves with four skill levels, 9 bonus screens, is 480 screens long (non-repetitive) and to complete it at the lowest speed would take 50 minutes from start to finish. Your planet (can the whole universe always be fighting to survive?) has been attacked by marauding aliens. You are patrolling it, and must cruise from city to city defending them against the hordes. (Alient are always hostile and in hordes, have you noticed?) At the end of each attack wave is a bonus screen, which you must complete in order to gain access to the next sector. Although you cannot be killed by fire on these screens, you can die by collison with one of the numerous obstacles.

There is also a variety of different aliens, all of whom behave differently. They have 80 different attack patterns, so predicting their next move can be pretty difficult! As you progress through the game, flying from city to city, wave to wave, the day gradually changes to night, adding a new dimension of difficulty!

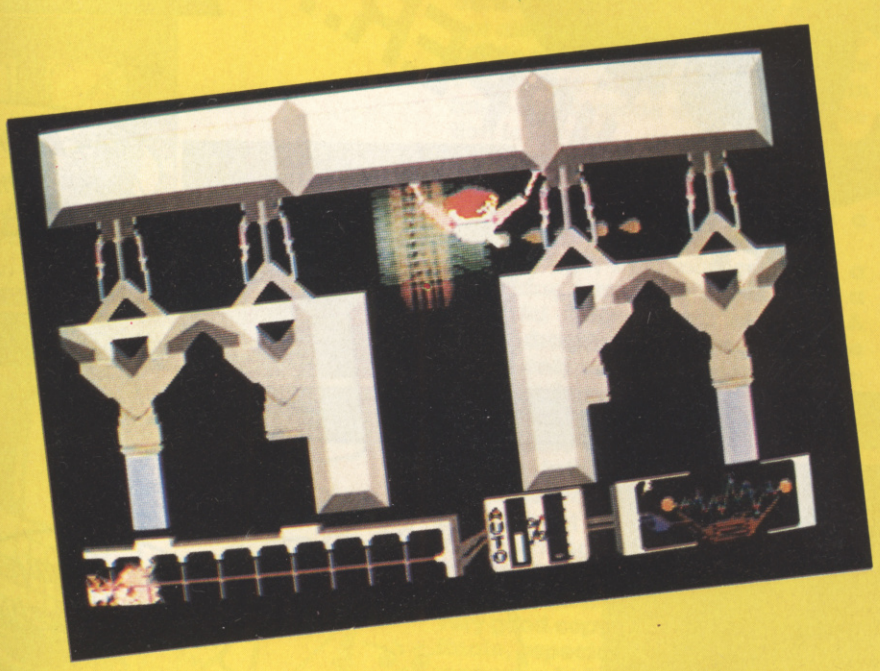
Sanxion is so complex, and its strategy so intricate, that it is actually necessary to map the whole thing out! Some of the obstacles need to be noted down, and their characteristics remembered otherwise it's impossible to get through the next time round, which really is not the best way to use a computer for a game. Surely it should be possible to contain all the game within the game.



Coming Soon!!!

CCI Rating C64 MEGA

Arac and the Arachnidroid



After a period that has produced a distinct lack of original games, we are now seeing an influx of them. Admittedly, they all have roots somewhere, but (hooray, hooray!) the game concepts themselves are beginning to look as if someone has used a talented imagination.

Arac is certainly original. It is hard even to find a name to classify it (strange, but addictive, nicely matching the name of its company, Addictive Games). Addictive classify it as an arcade adventure, but I think that a title of quest might be more suitable, at least for the first half of the game.

In Arac, you control a droid who's lost an arm and a leg... no, it hasn't paid for an Atari! Arac is missing several vital components, namely two legs (It's got three...) and a red power globe (reminds me of a certain Woody Allen...) (Keeping abreast of the cinema, are we? Ed). Once these components have been collected, Arac transforms into 'the devastating Arachnidroid' who has such power that he can even fall upwards (I'm sure Newton would have something to say about that — Ed)! As an Arachnidroid, you must battle your way through to the heart of the power house, where you have to stop the reactors over-heating by shooting the cores before they burn through. You have 30 minutes to complete your task, or 20 if you choose the short game option, and the game-arena spans over 100 screens.

To help you in your mission, as Arac you can capture various odd-looking beasties with your nets. You keep them prowling and swimming around a caged-off area of the screen. In exchange for their freedom, each will help you once only. Different creatures can help in different ways. The Stinger for example allows you to jump to greater heights, essential in some cases, and the 'Malevolent Man of War' can fuse some electronic circuitry. The Man 'o War is difficult to catch, and must first be stunned, so before it can be captured, you must get to be an Arachnidroid in order to be able to fire.

Arac and the Arachnidroid is a really enjoyable game, and one that kept me hooked for quite a while. If you want a very original game that's going to last, go out and get Arachnidroid'ed. You won't regret it.

Price: £9.95
Graphics: ★★★★
Sound: ★★★★
Playability: ★★★★
CCI Rating: MEGA

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MEGA REVIEW

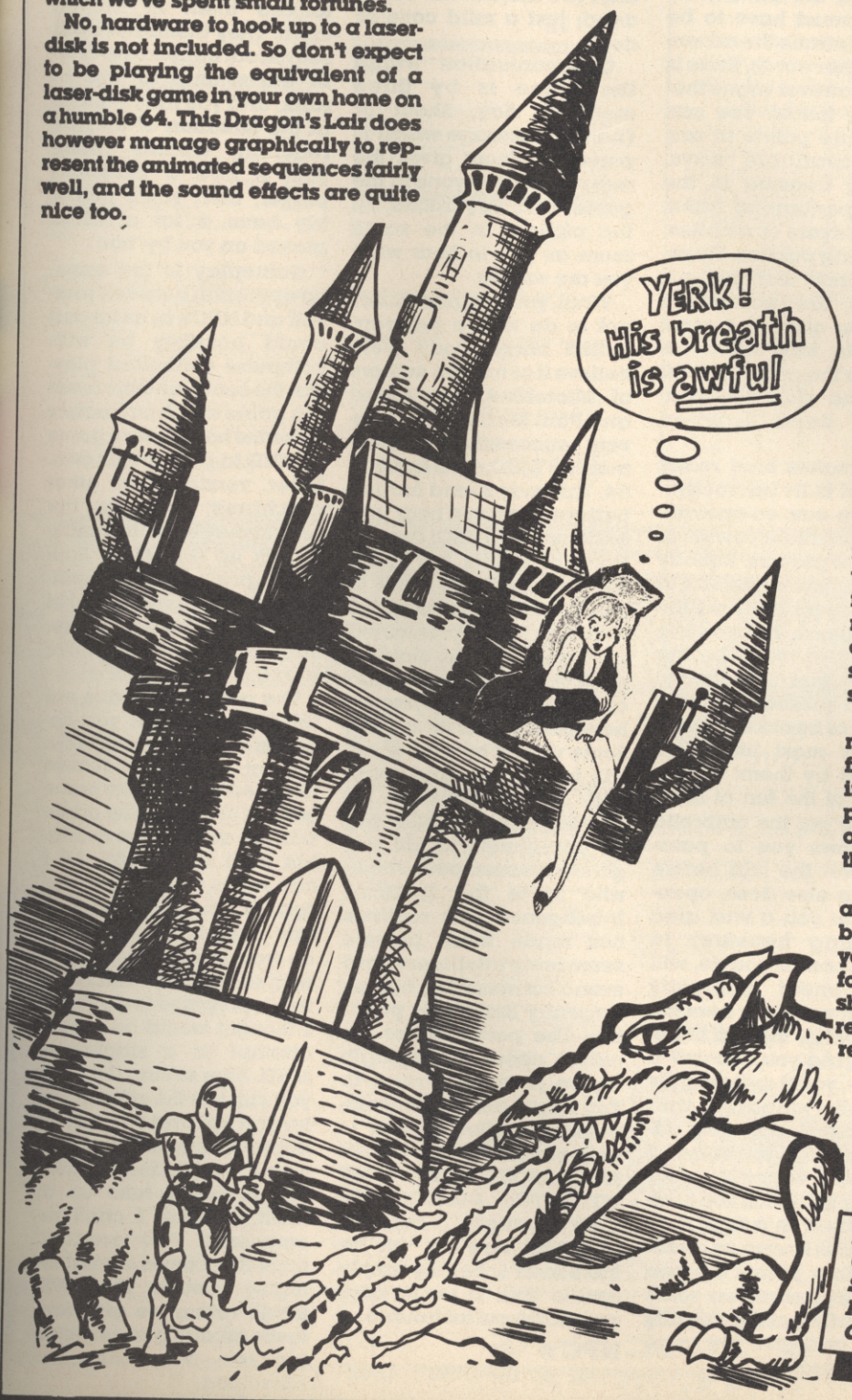
CCI Rating C64

MEGA

DRAGON'S LAIR

No, it's not the Arcade version on which we've spent small fortunes.

No, hardware to hook up to a laser-disk is not included. So don't expect to be playing the equivalent of a laser-disk game in your own home on a humble 64. This Dragon's Lair does however manage graphically to represent the animated sequences fairly well, and the sound effects are quite nice too.



Although nowhere near the standard of the arcade video-disk game, it does manage to capture the difficulty, excitement, and split-hair precision of the original. However, in the 64 version you have more control over Dirk the Daring, your character and hero, and are not just limited to simple left/right up/down commands. Unfortunately, Dirk does look rather gormless with something of a lack of facial detail. This cannot be attributed to only the game's authors, but also to the fact that it is very difficult to achieve high detail using the 64's sprites especially if you are in multi-colour mode where the resolution is halved.

Although many people have played Dragon's Lair, not many may actually know the plot. So here is a rundown.

"Long ago, in a magical time, a good king named Aethelred ruled a peaceful kingdom etc etc etc". A nasty dragon has kidnapped the King's only child, the beautiful Princess Daphne. Aethelred? Daphne? Strange clash of names there (So are yours, Julie baby! Ed) to try to force the King into giving up his lands and holdings. You, Dirk the Daring, have until sunset to rescue Daphne and save the kingdom from Singe (better than Puff I suppose) the dragon. The final screen showing the dragon is a very good copy of the arcade game's finale, especially the dragon, which manages to look incredibly evil as dragons should do in all good fairy stories. (This writing is really hot stuff, yawn. Ed).

Obviously memory restrictions mean that not all of the many screens from the arcade version could be included, but they have managed to put nine of them together, including one of my favourites, the battle with the phantom knight.

After seeing the demo disk earlier I await the finished version with baited breath. (I wouldn't if I were you. Never hold your breath waiting for a product, Ed). It is due to be shown publicly shortly, and should receive wide-spread acclaim if this review copy is anything to go by.

Price: £9.95 C
Graphics: ★ ★ ★ ★
Sound: ★ ★ ★
Playability: ★ ★ ★★
C.C.I. Rating: Mega

MUG page

Micromud

Another Exclusive!

The Ultimate in Adventure Games?

This month's MUD page sees a departure from its normal line of gossip and chat. CCI have managed to obtain an exclusive look at one of the most exciting developments in adventure games ever. The resulting program, MicroMud is all set to revolutionise computer adventures.

By now, you probably all know what MUD is.

For the uninitiated amongst you, I'll explain.

MUD (Multi-user Dungeon,) is an adventure that more than one person, indeed up to about 40, can play together at any one time. Don't get the wrong idea; it isn't each person playing the same adventure by themselves. In MUD, you ALL play the same adventure together. In other words, you are up against other sentient (?!) players all intent on getting to the treasures first and solving the puzzles before you do.

Treasure you collect is dropped in the Swamp to give you points. To become a Wizard, which is the aim of the game, you have to score 102,400 points which takes rather a long time! You start at novice, and gradually work your way through the ranks to Wizard should you be so lucky! Once you are a Wizard, you have ultimate power in the game. You can yourself actually alter the course that the adventure takes for the players.

Narrow Road

Mud is not like ordinary adventures in that you can save your position and possesions. Every few hours, the game is 'reset'. In a reset, all object positions, computer-controlled monsters (mobiles), and puzzles are set to their starting states and everybody is chucked out of the game for the duration of the reset. As there are thousands of different ways of getting to Wizard, depending on what treasures you discover and which you decide to collect, there are no objects that you must have to be able to continue the adventure. In other words, there is no path however vague that you must follow. You can accumulate points in any of the available ways; dropping treasure in the swamp, performing tasks, killing players or mobiles, and solving puzzles. Therefore, objects that you are carrying are not saved when you quit, or a reset occurs. In fact, whenever you enter the game you will be at the start location, 'Narrow Road between Lands'.

What makes Mud really stand out is its interactiveness. You can co-operate, kill, make alliances with, or help other players. Equally of course, you could TRY to remain apart from all the other players, but you are unlikely to succeed. During your play, you are bound to be asked questions by other players, or be asked to help them, or most likely, be attacked by them! This is all part of the fun of Mud. Can YOU get the umbrella that allows you to parachute over the cliff before someone else does, opening up to you a vast area containing treasures in abundance? If you do, will an opponent magically summon you back from the beach below the cliff thereby denying you access? If he does, you'll quite rightly be pretty annoyed and would most probably attack him on sight! The end result will either be your death or his. Once you have been killed in a fight, you are what is known as dead-dead. Your points are permanently lost unless some very kind wizard takes pity on you and give you some of them back.

A Mild Case of Death

If you are killed by a natural cause, like drowning, then you die, but not dead-dead; just a mild case of death.

Communication within the game is by three methods; Say, Shout or (name), message which is personal. Shout gives the message to everyone in the game, and Say allows all the players in the same room as you to hear what you are saying.

What, you ask, has all this got to do with a program called Micro Mud? Well, believe it or not, the authors of MicroMud, Jon Stuart and Paul McCraken have very successfully implemented MUD on a humble 64. This may sound hard to believe when you hear that MUD runs on a DEC10 mainframe computer, but nevertheless, they have done it. The computer controlls 10 articifical players selected randomly at the start of each game out of selection of 100. All of these personae have distinct personalities. Some will be helpful, some will ignore you, and some will quite definitely be downright vicious, leaving no opportunity to kill you go by unattempted. Paul, who wrote the Artificial Intelligence (AI) routines has made these players seem fairly intelligent, and even a conversation, though naturally limited, is possible. The portcullis for example needs the strength of two players to raise it. You might ask Druin, computer-controlled player, to help you by typing: DRUIN HOW ABOUT HELPING ME WITH THE PORTCULLIS?

He might, respond with 'Not now' or 'Ok be there soon' or he may simply ignore you. If he ignores you, watch out for trouble...

NPC's

All of the NPC's (Non-Player Characters) have ambition, just like you do. They will remember from game to game if you attacked them or helped them. They themselves will search out treasures to drop in the swamp to rise in rank, and you may even be in the situation of an NCP reaching Wizard before you! If he's a malicious player, then you'll probably have a lot of tricks played on you by 'him'.

Gameplay is the same, co-operation between yourself and NPC's is, as far as it could possibly be with computer controlled players, the same, and the result is a game which accurately gives the home user a game of MUD to play on his own. Later versions on other machines such as the Amiga may have the ability to link up with other Amiga's to produce a real multi-user game. Even the feel of the original game is there, including the competitive spirit.

The game is not due out for a few months yet, because of the enormity of the project. Because the need of extensive game testing required, the game will not actually be available until early 1987. All I can say is, when this game appears buy it at any price! I'm a regular MUD player as you know, and it was with some dread that I originally prepared to view what I thought would be a poor attempt at a single-user MUD. After seeing it, I think you can see the effect it has had on me, and I'd be quite happy to spend £30 on this game, which incidentally will probably take up at least 2 disks. I can't recommend this product, once it becomes available, highly enough. The AWESOME rating we give fantastic arcade games seems too low a grading for MicroMud.

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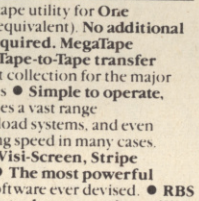

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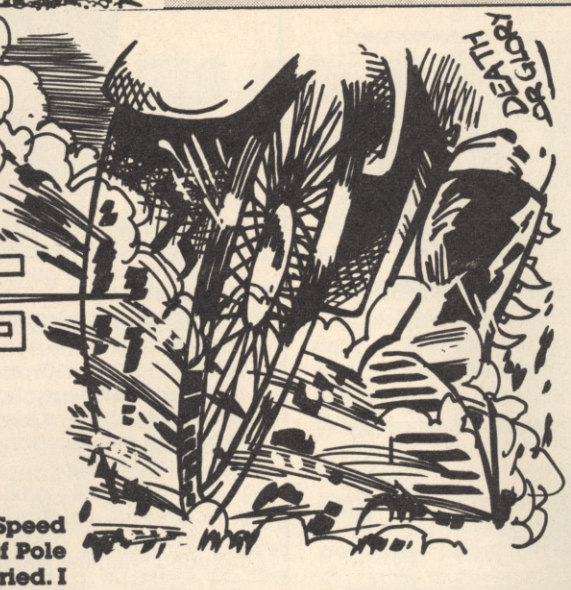
MEGA REVIEW

CCI Rating C64

CRISP

SPEED KING



Speed King by Mastertronic

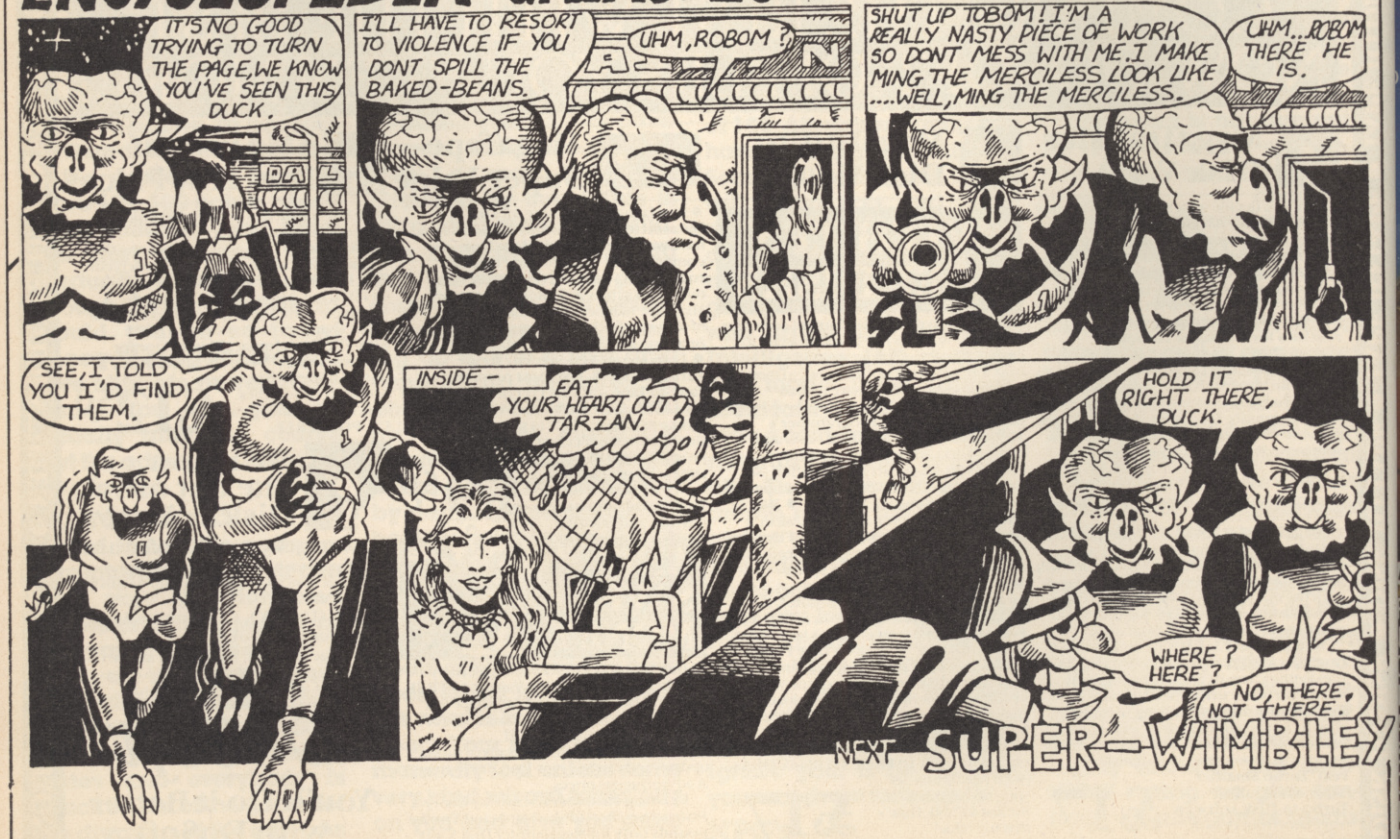
I think it would be difficult for Speed King to get closer to a copy of Pole Position, albeit on a bike, if it tried. I am sure that more original track graphics could have been used, and surely a background of brown mountains could have been improved? However, these criticism apart, Speed King plays quite nicely, and I especially liked the graphics representation of the biker leaning into the turn, and when he flies head over heels after a wipe-out. Kerrump! and very "Ouch"!

Sound effects are quite good too, although I do think that the engine noise could have been made to sound less like a 150cc rally-bike aka mosquito, and more like the high-powered speed machine it is supposed to be representing.

Although there have been umpteen car-racing games, there have not been so many motorbike ones. I myself preferred Speed King over its nearest cousin Pole Position because of the positive feel of control you have when manoeuvring the bike. Fast and quite fun.

Price: £1.99
Graphics: ★★★
Sound: ★★★
Playability: ★★★
CCI Rating: CRISP

ENCYCLOPEDIA GALACTICA 4; THE DUCK HUNTERS



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Adventure

Text adventures, which looked so easy to create 4 years or so ago sprouted forth from every guy with a head for programming, and a company through which to market it. With the arrival of Infocom in the US, and Level 9 here in the UK, public awareness to the possible quality of adventures grew, as did demand for adventures of this quality. Finally, adventure creators who were any good generally became integrated into one of the many software houses that have sprung up over the last few years. Some have succeeded, and some have not but the end result is that we now have a very strong adventure force in the UK in the form of Level 9, who have rightly earned themselves the title of top UK adventure house, despite many challenges. While Infocom continues to dominate the US scene, Level 9 specialises in high quality, well presented adventures with intricate plots and good prose. Although in the past there have been complaints about their parser (the program that interprets what you type), these have changed to praise following the release of Jewels of Darkness (see review below) with a re-vamped parser. The Pawn from Rainbird, created by Megnetic Scrolls, has received wide acclaim, with a great many reviewers going slightly loopy over its parser. This is all very well, but is it really necessary to be able to say 'get the jar which is inside the bag which is inside the hollow log which has a red flower in it'? Wouldn' 'get jar' be better, with a reply from the program of (Jar from bag in log taken) be better, and easier. The Pawn managed to get excellent reviews in spite of this parser, and for the graphics which really are very good indeed. Unfortunately, the game lacks any real structure. What I man by this is that the plot itself is not too substantial, and as an adventure it is rather loose.

Why do people buy adventures anyway? Adventures tend to appeal to those with either a vivid imagination, or those with an above average intelligence. Those with imagination because they have the ability to visualise what is being displayed as text on the screen as images in their minds, and those with high IQ's because they see it as a challenge. Of course I am not putting these people in some elite class of their own just because they enjoy playing adventures, but simply illustrating where interest in adventure games lies. Infocom have always said that the mind is more powerful than the hi-res display, and I'm inclined to agree. By not wasting memory on graphics, it is possible to include more rooms, with better descriptions, and also enables the designer to incorporate more puzzles and strategy which is what makes or breaks an adventure. An adventure with few puzzles is boring; one with too many is frustrating, so a fine balance needs to be struck between the two.

Adventures present the player with what almost amounts to an alternative reality. In fact so engrossed can people become in adventures that they develop an alter-ego, perhaps a mirror of their 'normal' personality. This does not occur so much in ordinary adventures, but more in multi-user games such as MUD where a player can interact with other players and really act toward them in the form of this alter-ego. As regular readers of this magazine will know, CCI leads in the coverage in multi-user games and you can follow their development on our MUG page.

Adventures are rapidly growing in popularity. Every month we receive more and more to review. Is this because those people who 2-3 years ago were satisfied to play arcade games have now partially tired of them and want something new; a new challenge? Shooting them up is not by any means so much demanding of thought, more of reflexes and reaction.

With the appearance a few years ago of the Ultima series marketed by Origin Systems in the States, people started to realise that adventures didn't have only to be in the form of scrolling text, but could also be graphically represented without any loss to the game itself. Indeed, the reason Ultima succeed in creating the cult following it has to day is because of the atmosphere and mood it generates, greatly aided by some really good eerie music which changes depending on your situation. Ultima IV arrived in the office the day we went to press, so unfortunately we cannot dedicate the double page spread we would like to it. Next month we will be carrying an in-depth review of it, but from what I've seen of it in the few hours I had before we went to print, it looks even better than Ultima III which has kept me hooked for months. The new Ultima is 16 times the size of Ultima III, has 'semi-intelligent computer-controlled characters, and gameplay that is just simply compulsive. Watch next month's issue for the full, personally-played report.

The four adventures reviewed in this issue are Time of the End, four Manadrin Adventures, Mandragore from Infogrames (a French company), Jewels of Darkness which is a compilation of three Level 9 adventures who are, believe it or not bringing, through Rainbird, three trilogies — yes three — before the year's end, and finally Rebel Planet, a Fighting Fantasy conversion.

Jewels of Darkness is a compilation disk/tape of three of Level 9's most famed adventures. Colossal Adventure, the alltime mainframe classic, Adventure Quest, and Dungeon Adventure are all included. Value for money, this is an excellent package, offering three favourites in one. By the way, 'Darkness' comes with the lenslok protection device which I personally find a pain. It either gets lost or trodden on, and of course replacements are NOT available! Apart from this minor complaint, I think that for anybody who

hasn't played these before it's well worth buying. All three of them are acknowledged as classics and provide hours of hair-tearing frustrating entertainment which is what adventure play is all about isn't it fellow masechists? The games have actually been improved by the addition of graphics, extended description text, and a much enhanced parser making them even more enjoyable.

Accompanying Jewels is a long novelette, written by Peter McBride which presents in story form the background of the three adventures. I find it rather corny, but then I suppose that writing a fantasy novel is almost impossible without being corny, which interestingly shows the difference between doing something and reading about it. Nevertheless it makes fun reading and provides a good atmosphere to start playing the adventure.

Mandragore appears to be a slight ripoff of an American game that has been out for some time now, the Ultima series which are Dungeons & Dragons role-playing type games. This game too has a novelette, albeit it somewhat shorter and no less corny than the Jewels of Darkness one. It is, however, necessary to read the story to gain enough background information to play the adventure. Normally the preceeding novelette serves to provide atmosphere to the game, but I'm afraid that with Mandragore, it was just a chore having to read such badly written text.

The game itself on the other hand is quite good. You are graphically represented on the screen as are objects or locations in the land, such as castles. It must be said that the graphics are not superb, but then it is not vital for them to be so. Ultima's graphics were very, very basic but the game still has a cult following in which I include myself. Your mission is to rid the land of Mandragore from the evil clutches (sorry about the cliché) of Lord Yarod-Nor (where DO they get these names from? — Ed) who has imposed an evil tyranny on the country following the death of King Jorian (it should surely be Julian! Ed) who was killed by a shooting star.

Four characters comprise your team, and to kill the Lord you must confront him in his Chateau. To do this will mean you having to solve the mysteries surrounding the other nine chateaux in the land. As mentioned, your way will be aided if you have read the story which will give you useful insights into Mandragore's legends, monsters, and mysteries.

Mandragore is the first Infogrames title to be marketed in the UK, and deserves to meet with success. It may derive from already familiar if good ideas, but it is itself very well worth playing.

Time of the End is a conversion from a Spectrum title of the same name. Mandarin Adventures, the company marketing Time of the End (TOTE) is run by Keith Milner, who is also the author of TOTE. The game met with some success in its other format.

TOTE is set in the future when Earth is being devastated by a series of seemingly natural disasters. The fabric of civilisation is starting to crumble (if you look around your desk, JR, you will see the process has already begun! Ed) but mankind struggles bravely on. This is where the wit of the author starts to show through. These disasters are not in fact natural, but are being caused by a group of bored and demented aliens who, tired of the montony of their lives decide to have a little fun by making it hell for others! (Do you recognise anyone we know? Ed)

The game continues in this spirit throughout, and it was nice to be presented, after a very long gap, with a plot that was both original and witty. It manages to combine wit and atmosphere to form a highly playable game, especially at the price of £2.95!

Rebel Planet is one of the Fighting Fantasy series of adventures, marketed by US Gold. That's very much a sign of the growing popularity of adventures, when you remember that US Gold built its business on the less intellectually demanding style of games. "RB" is a "save the world and be a hero" game, with you as the human race's last hope for survival in the threat of being engulfed by the evil Arcadian Empire.

Rebel Planet is quite difficult right from the start, and I was not too impressed by the parser, or the response messages. However, these are minor gribbles, and altogether it's a pretty nice adventure to play.

MEGA REVIEW

CCI Rating

MEGA

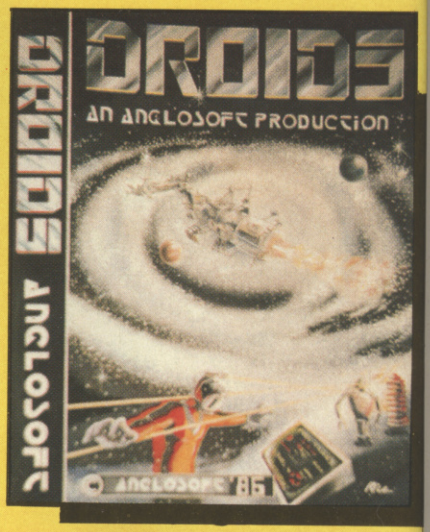
DROIDS DROIDS DROIDS

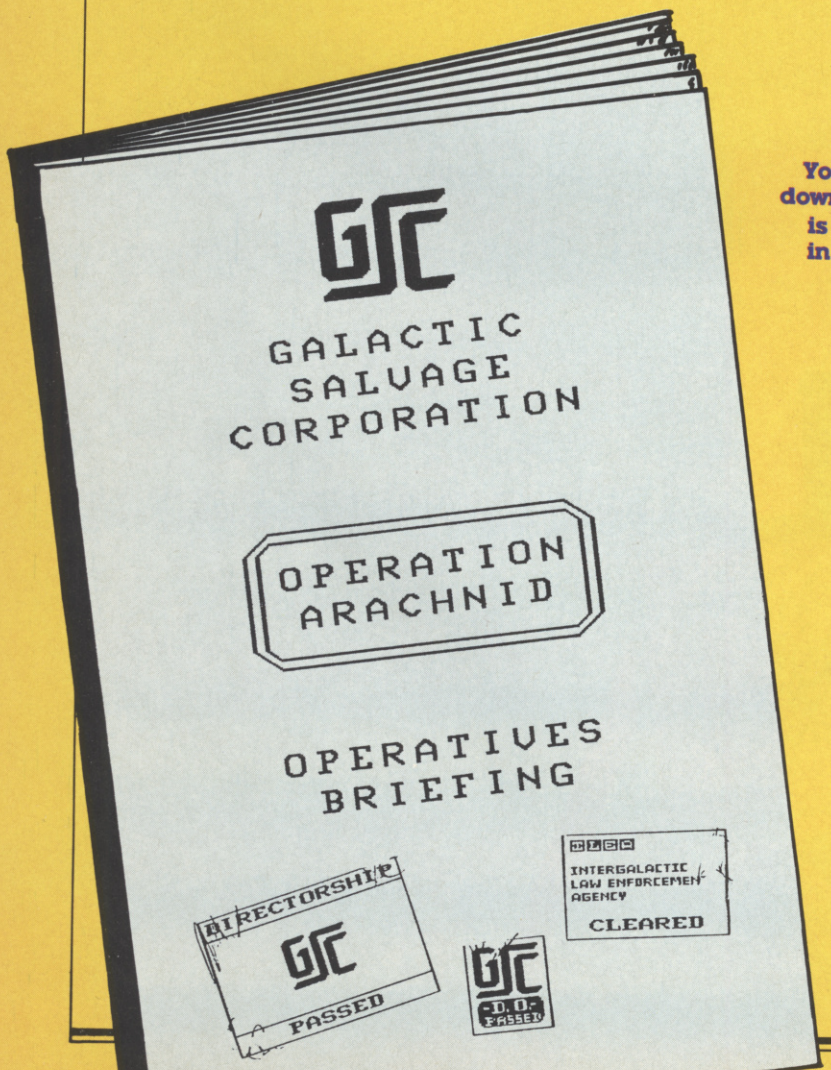
Droids: Operation Arachnid from Anglosoft

This game caused some confusion when it came to reviewing. We had the Mission manual, which said Operation Arachnid, and then we had the packaging which said Driods. When the two became separated, we thought they were two separate games, and much hunting was done before the two were linked together! Still, once we'd discovered that Droids was in fact Operation Arachnid, things proceeded smoothly. Droids is Anglosoft's first game, and is a really good first release.

The Intergalactic Law Enforcement Agency has been carrying out secret trials of a new warship called the Arachnid, on an orbital path between Venus and the Sun. A freak solar flare damaged the ship's on-board computer, EDWARD (Environmental Defence WARDen-very original!) and all contact with the ship was lost.

Your mission is to disable this warship, at any cost! Because of the advanced nature of the ship, it is impossible to destroy it in combat. You have to board The Arachnid and shut down each deck individually. Only when the deck has been cleared of the hostile droids can you activate shutdown procedure.





You have five attempts to shut down a deck. The control sequence is in a code, so the 5 bits must be set in the correct positions, and you have 5 attempts to do this. Each attempt requires 40 energy units, and as you only start with 255, you'll have to be careful! It is possible to replenish your supply, but this is somewhat risky.

This is one of the most original games to emerge this year. CCI has been complaining that the same old ideas are trotted out, with only slight variations, again and again. Anglosoft has taken up the challenge and have cracked the originality barrier with this one. The verdict is good, good, good. Nicely packaged, with a reasonable instruction manual and high quality gameplay makes this fully deserves a MEGA. Great value! Buy it now!

Price: £7.95c/£9.95d
Graphics: ★★★★
Sound: ★★★
Playability: ★★★★
CCI Rating: MEGA

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Competitions

DOMARK COMPETITION (TRIVIAL PURSUIT)

To herald the launch of Domark's new game, Trivial Pursuit, the official version, we are being supplied with a copy of the new copy of the Genus II edition of Trivial Pursuit, the board game, and 10 boxes of Trivial Pursuit After Dinner Chocolate Minis for the runners up. The winner will then be invited to London, all expenses paid, to take part in the Trivial Pursuit final, where all the winners from other magazines running the competition will battle their knowledge of absolute trivia against each other! The winner of THIS final competition will receive a solid gold Trivia Pursuit set valued at £10,000! This is a unique prize; it is the only solid gold game ever made.

All you have to do is answer the five trivia questions below, and supply a question of your own as a tie-breaker. These questions may be used in a future version of Trivial Pursuit. All entries must be received by October 12th. The judges decision is final. No correspondence will be entered into.

1. For what reason is the Perrier bottle so shaped?
2. What was CBM's first product?
3. In which year was the 1812 Overture written?
4. What is the record for the number of monogomous wives any one man has married?
5. From which port did Christopher Columbus set out to find the new world?

WIN TERRIFIC WINTER EVENTS VIDEO RECORDER!

ANCO's Awesome rated Winter Events has got to be one of the great C16 releases of the year. Just tell us:-

1. Where the last Winter Olympics were held?
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3. The names of three different championship ski events?
4. What are the events of the Biathlon?
5. How many events are there in ANCO's Winter Events?

Answers on a postcard to CCI by October 15th. First out of the competition sack for the great Video Recorder could be you!

LEAPER COMPETITION (DISK DRIVE)

To celebrate the launch of their new game, Leaper (see review in this issue), Peter 'Santa-Claus' Holme of Bug-Byte has very generously supplied us with one of the new, 1541 compatible disk drives, the Enhancer 2000, which is reviewed in this issue.

Just answer the five questions below, and write your answers in on a postcard.

1. Which microprocessor does the Enhancer have inside it?
2. Which well-known Japanese camera company manufactures the Enhancer?
3. Name four disk-based adventures (from different companies).
4. What capacity does the 1541 disk drive have (in terms of K)?
5. What are Gribblies and GubGubs?

All entries must be received before October 12th. The judges decision is final. No correspondence will be entered into.

WIN 25 COPIES OF THE GREAT NEW MEGA RATED C64 DROIDS FROM ANGLOSOFT

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1. What is a Droid?
2. In which film did Robbie The Robot appear?
3. What is a Cyborg?

Answers on a postcard by 15th October (tell us whether you want a cassette or disc).

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Any CCI readers buying Script Plus are automatically entered in a special draw. The prize? Your very own AMICA!

Also, FIVE free Calc/Plus packages are up for grabs for five lucky CCI readers placing orders using the Parasoft coupon in our August issue.

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Win friends and influence people with a copy of the Collins "Dictionary of Computing" (see review). We have 10 copies to give away to the winners of this simple competition. Just explain what the terms listed below mean and send your answers on a postcard to: Dictionary Competition, CCI, 40 Bowling Green Lane, London EC1R 0NE. Closing date: 15th October.

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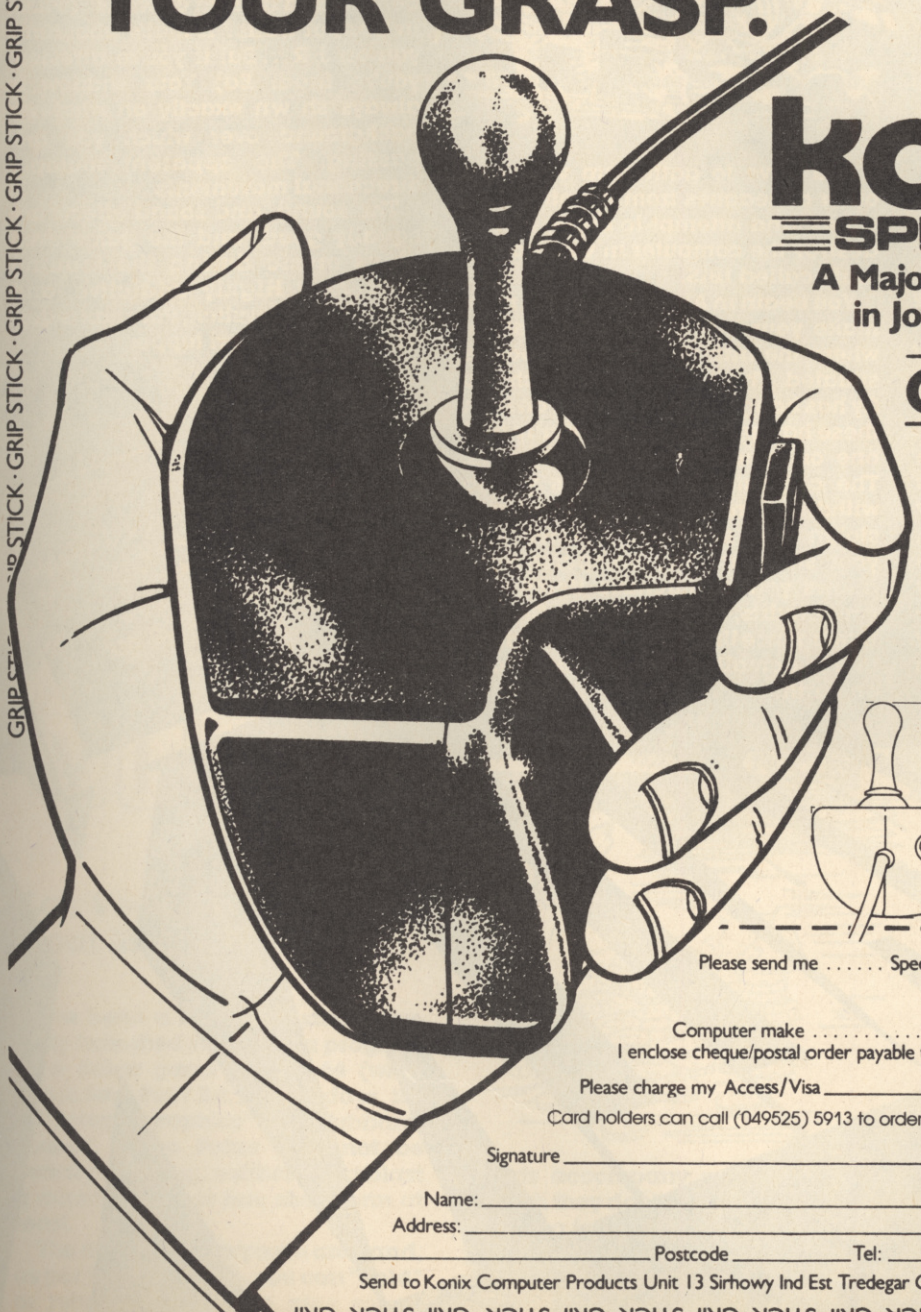

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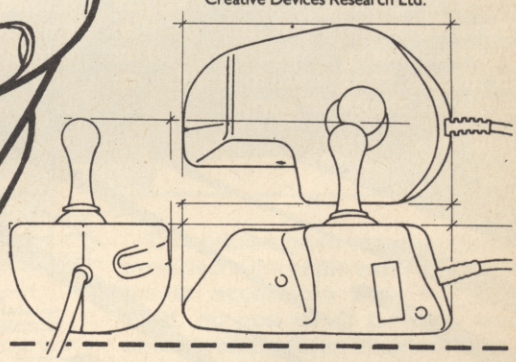

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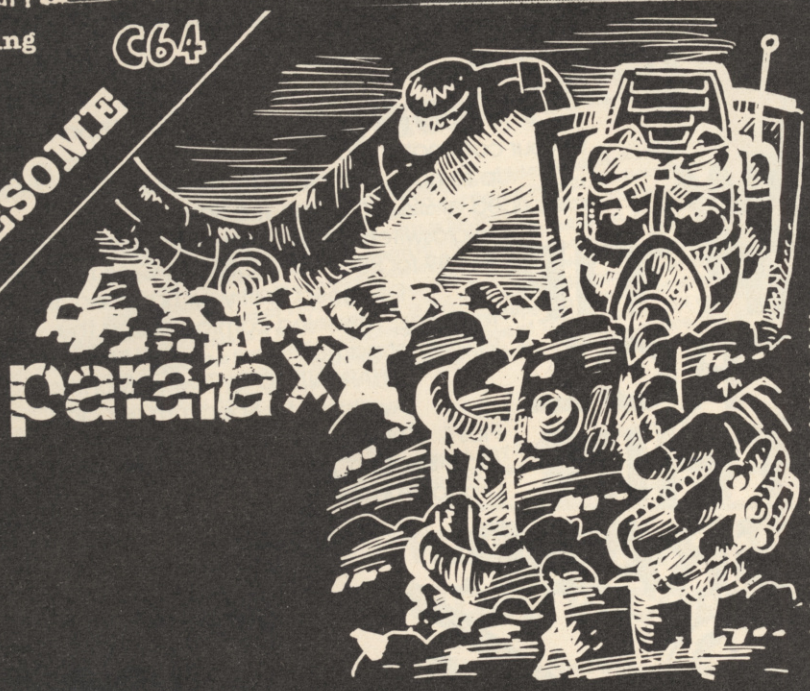
MEGA REVIEW

CCI Rating C64

AWESOME



Parallax from Ocean Software

The current trend-setters are smooth-scrolling, detailed background multi-level playfield games. Phew! Parallax is exactly that and is a truly awesome game. The setting is on an artifical world, where, yes! You have to save the Earth yet another time (sigh-you've done that three times alreay today! Ed).

A space probe has landed you on the surface of this world, which is divided up into five large zones very originally called Alpha, Beta, Gamma, Delta and Epsilon. The inhabitants of this world seem kindly disposed towards you, until you discover their secret plans, drawn up by the master computer, to launch an imminent attack on Earth!

You have to gather up your four other colleagues from the other four zones, and attempt to break free to destroy the computer in your spacecraft, called IBIS.

You begin in Alpha zone, and must make your way through to Epsilon, where the intergalactinc teleport is situated. The surface over which you fly has hangers strewn about on it. In these hangers you will normally find one or more of several computers. The computer Bank allows you to withdraw credits, using datacards stolen from scientists stunned with your stun-gun. The computer Shop allows you to purchase items with your credits, and finally the Central Intelligence Unit which is the machine that is actually planning the attack on Earth.

Parallax features really good, detailed overlaid scrolling, with a planet surface, and a surface above, which scrolls in all directions as you move with incredible smoothness. The extremely clever scrolling is the first I've seen that provides an SF movie like realism. You can fly in and out of gaps Star Wars style, and flash behind and in front of 'walls'. ('Flash in front of walls? If that's what turns you on J R... But if you're arrested, you're fired! Ed) Your shadow is always sh wn exactly on whatever background over which you are passing. The apparent multiple directional movements.

The sound, and sound effects are equally good, and the game even plays music during the loading sequence! Highly addictive, and tough on the joystick, Parallax is destined to be a chart topper.

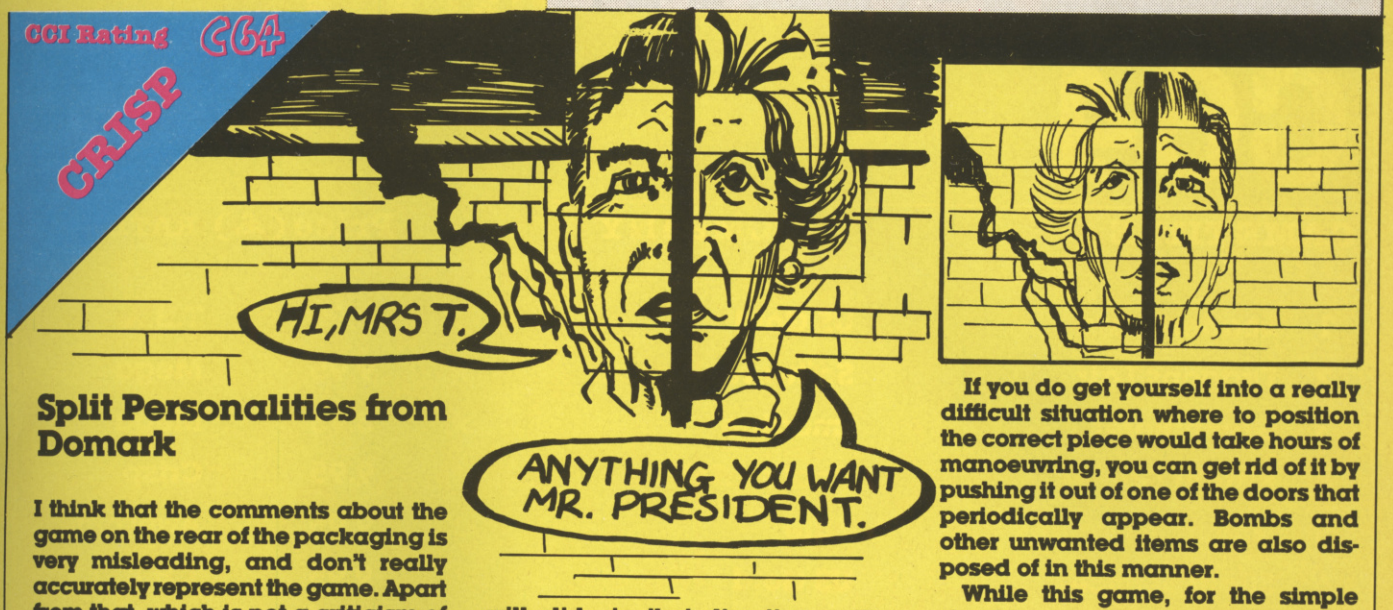
Price: £ 8.95 Cass £ 12.95 disk
Graphics: ★★★★★
Sound: ★★★★★
Playability: ★★★★★
CCI Rating: AWESOME

PARALLAX

MEGA REVIEW

CCI Rating C64

CRISP



Split Personalities from Domark

I think that the comments about the game on the rear of the packaging is very misleading, and don't really accurately represent the game. Apart from that, which is not a criticism of the software, Split Personalities is good fun.

The idea is very simple and goes back to an old box game I remember called "Physiognomy", which the police seem to use for their "photofit" pictures of people "wanted for questioning". You have to build up a split picture of the current character by sliding around squares representing bits of it. When you push a piece, it will slide in that direction until it encounters either a wall, another piece, or a black crack in the wall. It stops when it hits one of the first two, but if it hits a crack, it rebounds back along its previous path. The complex bit is re-arranging the pieces after you've brought them onto the board!

Not only pieces appear. Fuel and matches, which explode if they collide, are amongst the paraphernalia which complicates the task.

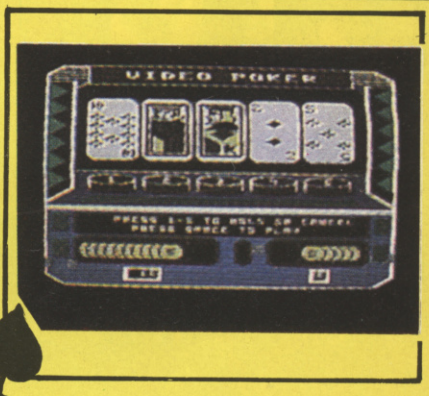
If you do get yourself into a really difficult situation where to position the correct piece would take hours of manoeuvring, you can get rid of it by pushing it out of one of the doors that periodically appear. Bombs and other unwanted items are also disposed of in this manner.

While this game, for the simple shoot 'em up brigade might start to get a little tedious after a while this is certainly an original idea, and is very different from other recent releases.

Price: £8.95
Graphics: ★★★
Sound: ★★★
Playability: ★★★
CCI Rating: CRISP

CCI Rating C64

CRISP



Las Vegas Video Poker from Mastertronic

It has been a long time since anybody launched so simple a program as a poker game on the 64 (what about Sam Fox? Ed.). Nowadays, it's all "grasp-o-graphics" and "Hubbard-Sound". Video Poker may not be exactly stunning, neither is it a blast a minute, but it is fun; short term at least.

The display shows your h and, and, as per the real game, you can "hold" or return cards. Some nice sound effects accompany your plays too. Though they don't actually represent anything in particular. (I'm told that you can't sell a game without sound, even if there is no particular need for it — we gotta have NOISE, boy!)

The authors have very thoughtfully provided a list of the various winning hands accessible from the game itself, so you don't have to worry about looking them up every time in the instruction sheet. The game quotes itself as being the most realistic simulation of the "famous Las Vegas video poker machines". Not having been to Las Vegas, I can't say whether this is true or not, but it's quite enjoyable nevertheless.

Price: £1.99
Graphics: ★★★
Sound: ★★★
Playability: ★★★
CCI Rating: CRISP

TOP TWENTY

C64

	GAME TITLE	COMPANY		Price (£)	RATING
1	Leaderboard	US Gold	↑	9.95	T.B.A.
2	Dragons Lair	Software Projects	★	9.95	Mega
3	Green Beret	Imagine	★	8.95	Mega
4	Knight Games	English Software	↑	9.95	Crisp
5	Ghosts & Goblins	Elite	↑	9.95	Awesome
6	Silent Service	US Gold	↑	9.95	T.B.A.
7	Speed King	Mastertronics	★	1.99	Crisp
8	International Karate	Activision	↑	6.50	Awesome
9	Summer Games II	US Gold	↑	9.95	Awesome
10	Equinox	Microgen	★	9.95	T.B.A.

C16

1	Speed King	Mastertronics	★	1.99	Crisp
2	Frank Brunos Boxing	Elite	↑	7.95	Mega
3	Bombjack	Elite	↑	7.95	Mega
4	One Man & His Droid	Mastertronics	★	1.99	T.B.A.
5	Oblido	Mastertronics	★	1.99	Mega
6	Project Nova	Gremlin	↑	7.95	Mega
7	Fingers Malone	Mastertronics	★	1.99	Crisp
8	Winter Events	Anco	★	7.95	Awesome
9	Yie Ar Kung Fu	Imagine	↑	7.95	T.B.A.
10	Street Olympics	Mastertronics	★	1.99	IFFY

★ = NEW ENTRY

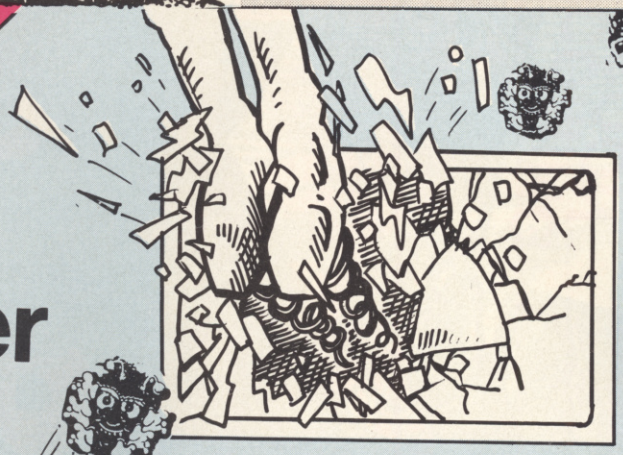
Compiled by CCI from leading distributors

MEGA REVIEW

CCI Rating C16

MEGA

Leaper



Leaper is a game from Bug Byte – the budget label that released Twin Kingdom Valley, Daigon, etc. They've come up with another winner here with Leaper.

As I loaded this game up I was impressed with the base loading screen on the C16 yet – it was brilliant – a good start. Then the music – wow – another plus, I liked this game before I even started playing it!

The aim of the game is to get to the top of the screen and put your name in lights, one letter at a time. You have to leap up seven platforms to light up one letter of your name, jumping through the holes above you and avoiding the ones below. As if this weren't enough there are six really nasty Gribblies (Gribblies? Who thought up that name? Sounds like a particularly revolting brand of crisps! Ed.) who are out to get you these include the last VW, a flying saucer and my favourite – GubGub. All of these are both superbly drawn and animated, as is your own personal sprite, who, when motionless, stands with hands on hips looking left and right and bobbing up and down.

If you happen to walk into or leap a Gribblie, or jump into a letter of your name you die. You also die if you lose all your energy. You lose energy by jumping onto a platform incorrectly or falling from one, and as this happens frequently when you first start playing you will be thankful for your five lives.

At £2.95 this game is a sensation. Well done Martin Gannon and Bug-Byte.

Price: £2.95
Graphics: ★★★
Sound: ★★★★★
Playability: ★★★★
CCI Rating: MEGA

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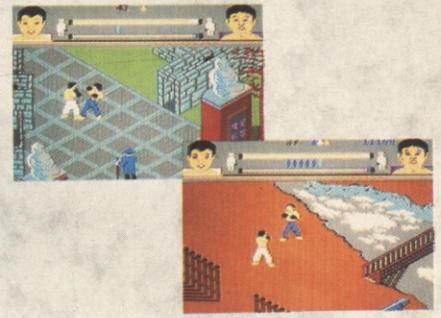

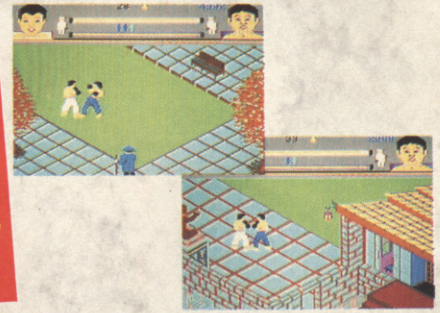

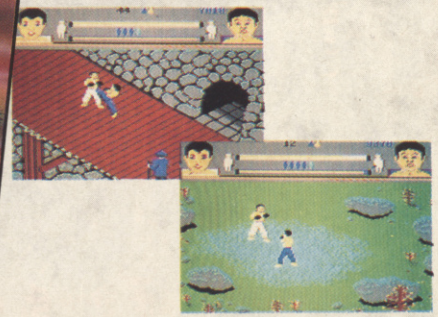

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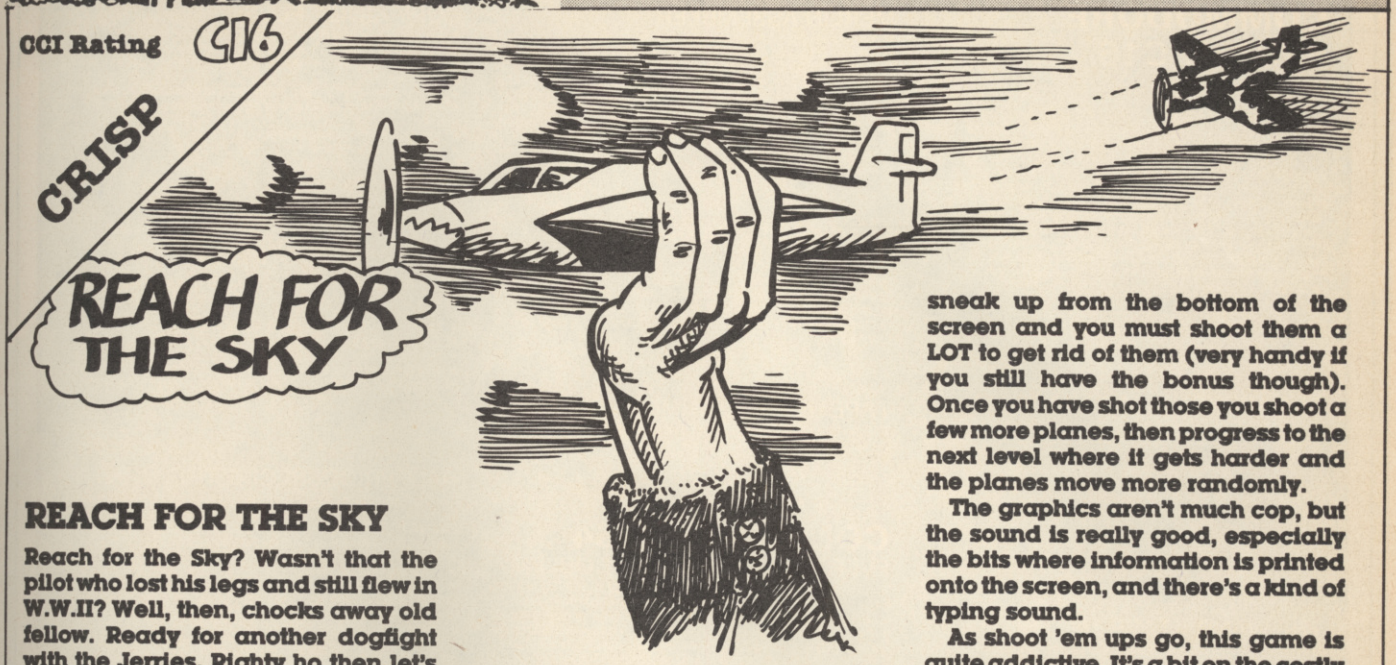
MEGA REVIEW

CCI Rating C16

CRISP



REACH FOR THE SKY

Reach for the Sky? Wasn't that the pilot who lost his legs and still flew in W.W.II? Well, then, chocks away old fellow. Ready for another dogfight with the Jerries. Righty ho then let's go! Scramble!

Scramble? Dogfights? That's an aero plane battle isn't it? So that means this is something like a Spitfire simulatioin, right? Wrong! That means this is a basic galaxions type shoot 'em up, and a good one at that. You are in, what I presume to be a Spitfire, at the bottom of the screen and you can move left, right and up a few inches. Hundreds of planes fly down at you. Some very awkwardly too, and you must shoot 'em up for dear life. Halfway through this carnage, a set of blue planes appear and fly across the screen. If you shoot them *all* you get the welcome bonus of double barrelled shots, so you shoot twice as many planes. Near the end of each level two bomber planes sneak up from the bottom of the screen and you must shoot them a LOT to get rid of them (very handy if you still have the bonus though). Once you have shot those you shoot a few more planes, then progress to the next level where it gets harder and the planes move more randomly.

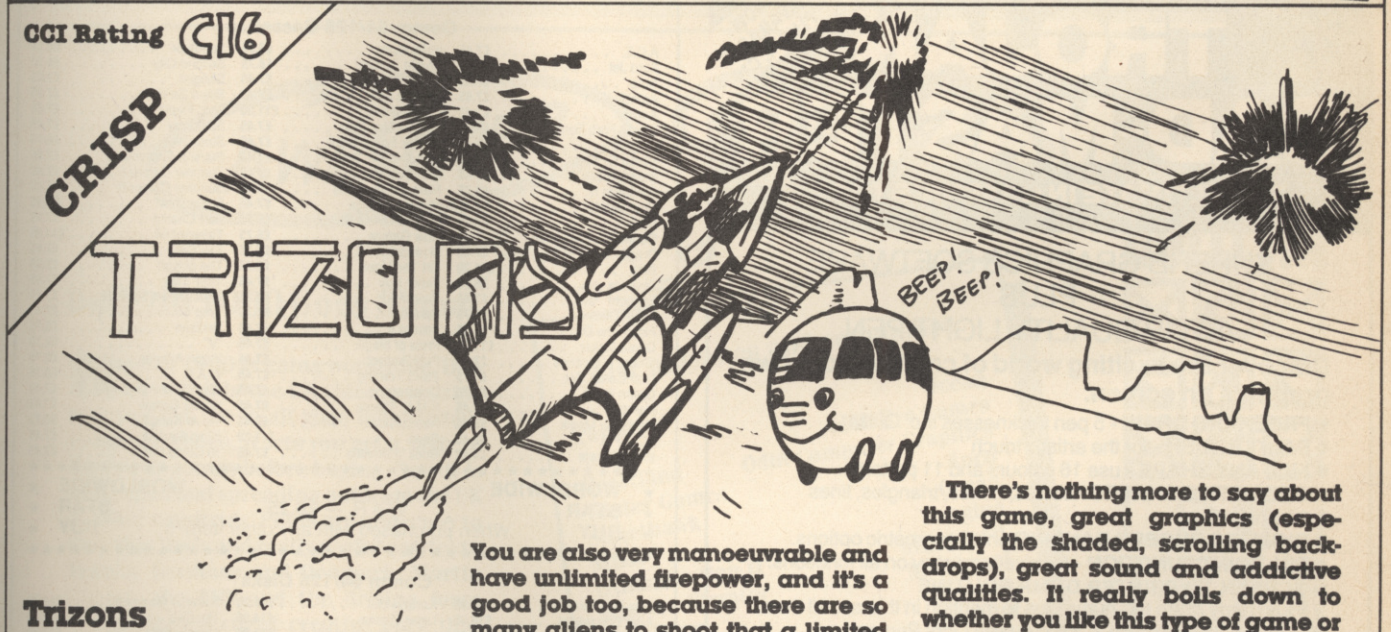
The graphics aren't much cop, but the sound is really good, especially the bits where information is printed onto the screen, and there's a kind of typing sound.

As shoot 'em ups go, this game is quite addictive. It's a bit on the costly side. Still it's a bit of a wizard prang, what?

Price: £6.95
Graphics: ★★★
Sound: ★★★★
Playability: ★★★
CCI Rating: CRISP

CCI Rating C16

CRISP



Trizons

With budget games becoming more and more popular, Bubble Bus have decided to enter the fray with their new lable, imaginatively named MiniBus (Beep! Beep!).

Trizons is a thirty-two level, fast scrolling, shoot 'em up. It has good graphics, sound, and is very addictive.

It scrolls horizontally and you can move in towards the screen a little. You are also very manoeuvrable and have unlimited firepower, and it's a good job too, because there are so many aliens to shoot that a limited amount of firepower. would have made the game impossible to play enjoyably.

At the top of the screen is a gauge showing how much Triz force you have got. This is really how many aliens you have shot, so when it's full you have completed that particular level. You have an energy gauge too but it doesn't seem to run out so that's no problem!

There's nothing more to say about this game, great graphics (especially the shaded, scrolling backdrops), great sound and addictive qualities. It really boils down to whether you like this type of game or not, and if you don't you'll only have forked out a few pounds. If you do like to blast them out of the ether, then this is for you. So go get 'em kid!

Price: £2.99
Graphics: ★★★★
Sound: ★★★
Playability: ★★★
CCI Rating: (Very) CRISP

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COMMODORE 64

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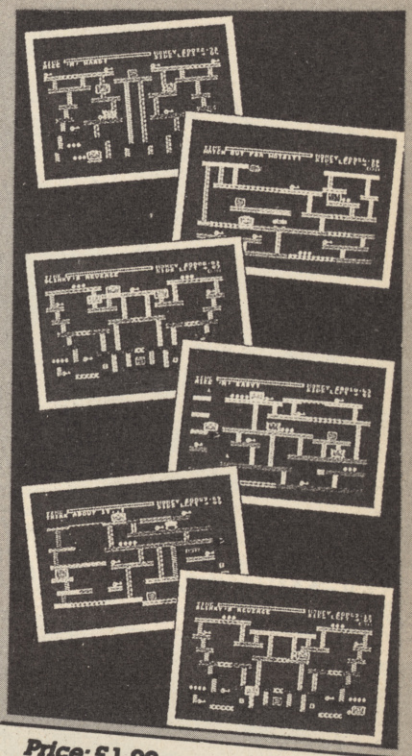
MEGA REVIEW

CCI Rating C16

CRISP

The Exploits of Fingers Malone



The C16 stalwarts, Mastertronic, have released yet another good game for this game starved computer. How do they find so many?. This time it's a ladders and platforms type game where you must collect all the keys and money dotted around the screen. This may sound easy but you have to avoid the gang of raiders 'who will try anything to stop you uncovering their swag' (Quote Mastertronic). Another problem is that the raiders move quickly and catch up with you quite easily. This is because poles which you climb up and down are one way and you have to be directly underneath them. Yet another problem (ANOTHER ONE?) is that you must go over every link in the floor before you open the safe and leave the room. On your side though is a life which you can call at the edge of a certain platform. This enables you to get about quite easily, though you must watch out for one of the raiders following you on to it.

The graphics and sound are adequate and a nice touch is when Fingers, the character you control, blinks at you. I will resist the temptation to call it 'finger blinking good. (I'm glad you resisted–Ed.)

With this game Mastertronic have produced another winner and I would recommend it to anyone with the two quid with which to buy it.

Price: £1.99
Graphics: ★★★
Sound: ★★
Playability: ★★★
C.C.I. Rating: Crisp

Bulletin 1000 Goes Global

Bulletin 1000 is going worldwide. Bulletin 1000 is the UK video magazine that you can see in all good independent computer shops. It lets you get a taste of the latest games before buying. Now it is moving on and spreading out from the UK to other countries. Plans are underway to take this lively and really useful service to France, Germany and Denmark. Martin Chater, the MD and the driving force behind the excellent creative work that goes into the video studio production that shows off the games, told CCI exclusively that there are even developments as far away from the UK as Australia. There is no doubt that giving you a chance to see a game first helps you pick out the right one to spend your money on. If your local computer store doesn't have Bulletin 1000, complain! Today the UK, Martin, tomorrow the world?

List of games and companies

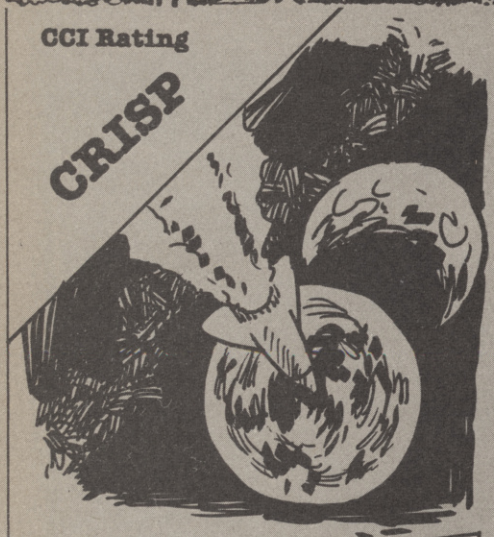
	Ocean
Parallax	Addictive Games
Arac	Odin Computer Graphics
Heartland	Anco
Winter Games	Ocean
Streethawk	Imagine
Mikie	Mirrorsoft
Dynamite Dan II	Micropool
Mission Elevator	Imagine
Ping Pong	Imagine
Yie Ar Kung Fu	Odin Computer Graphics
Mission A.D.	CRL
Room Ten	Ocean
Batman	Imagine
Green Beret	Gremlin Graphics
Jack the Nipper	Ocean
Miami Vice	Ocean
Knight Rider	

BULLETIN 1·0·0·0

MEGA REVIEW

CCI Rating

CRISP

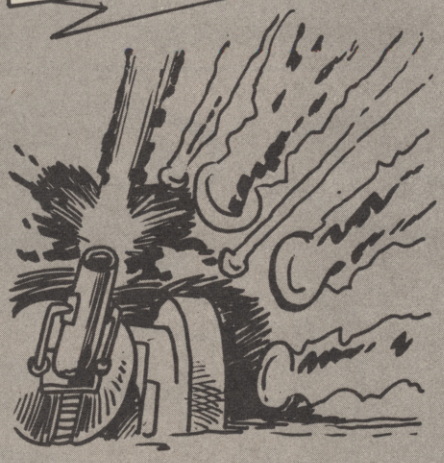


C16 CLASSICS...

FROM GREMLIN

DORK'S DILEMMA

TYCOON TEX



These three games are part of the compilation, C16 Classics, the other title, Dorks Dilemma was reviewed in the August issue. We gave it a well deserved 'Mega.'

XARGON WARS

On the same tape as Dorks Dilemma is Tycoon Tex in which you are a "rootin, tootin oil tycoon in the true Wild West tradition". Your job is to protect your pipeline from hazards like bombs, arrows and surface missiles. To do this you must run along your line braving sand, ice and snow. As you run, a bomber flies across and (surprise, surprise!) bombs you. You also have to jump over craters as you tear crazily along. Graphics and gameplay are crude and so is the sound. This in my opinion is the worst game on the tape.

Xargon Wars is the next on the list. It's the classic space invader type game that was popular some time ago but still is fun to play. You take on the role of a gunnery commander defending your planet from wave after wave of alien ships.

As you battle away a laser gauge on the right starts rising. If it gets too high your firing is cut off until it's temperature falls to a certain level. This adds an element to the game that makes it more than just another shoot 'em up and gives it more lasting appeal. The biggest drawback of this game is its speed. It's not really as fast as it might be.

PETALS OF DOOM

Petals of Doom is a totally different kettle of fish, pure, unmitigated violence and mayhem. Not so much shoot 'em up as annihilate 'em.

You have to shoot the aliens so your plants can grow successfully. When they are fully grown you can move on to the next cavern where the aliens get faster and very much meaner. You have a jetpack to help you shoot the alien nasties in the air but as in Xargon Wars when you fire and fly too much your power is cut off until it cools down to a suitable level. This is a very well presented game (as are the rest of the games in this compilation) with great sound and activity, the graphics, though reminiscent of Tycoon Tex, are much more colourful. This game, along with Dorks Dilemma, is the best in the compilation and they certainly make it worth buying.

Price: £9.95
Graphics: ★★★★★
Sound: ★★★★
Playability: ★★★★★
Overall: CRISP

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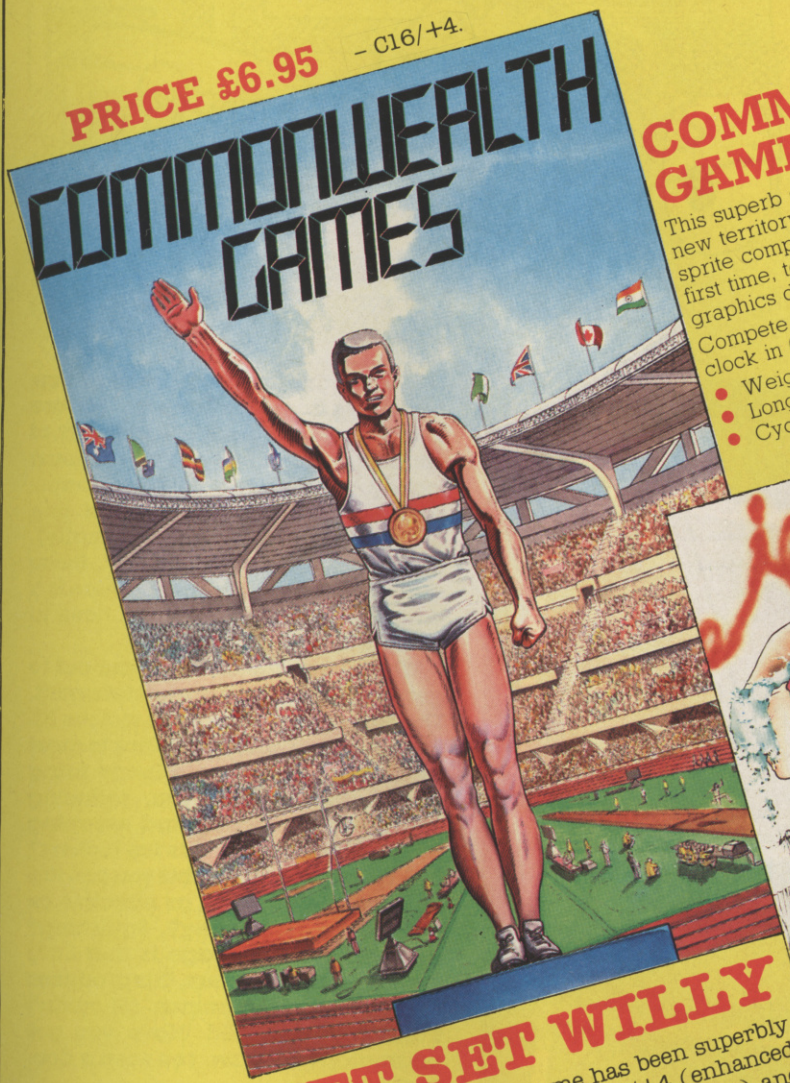

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- Rowing
- Hammer
- Swimming

JET SET WILLY

This classic arcade game has been superbly converted for the C16/+4 (enhanced version for +4 only) and BBC/Electron.

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TYNESOFT
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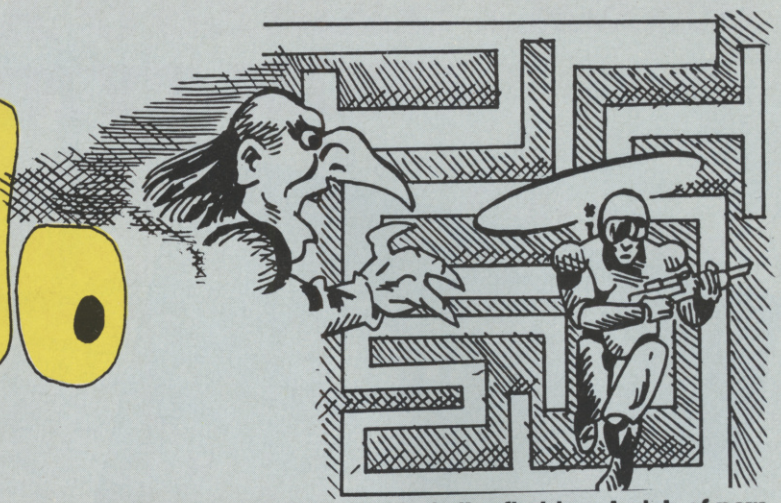
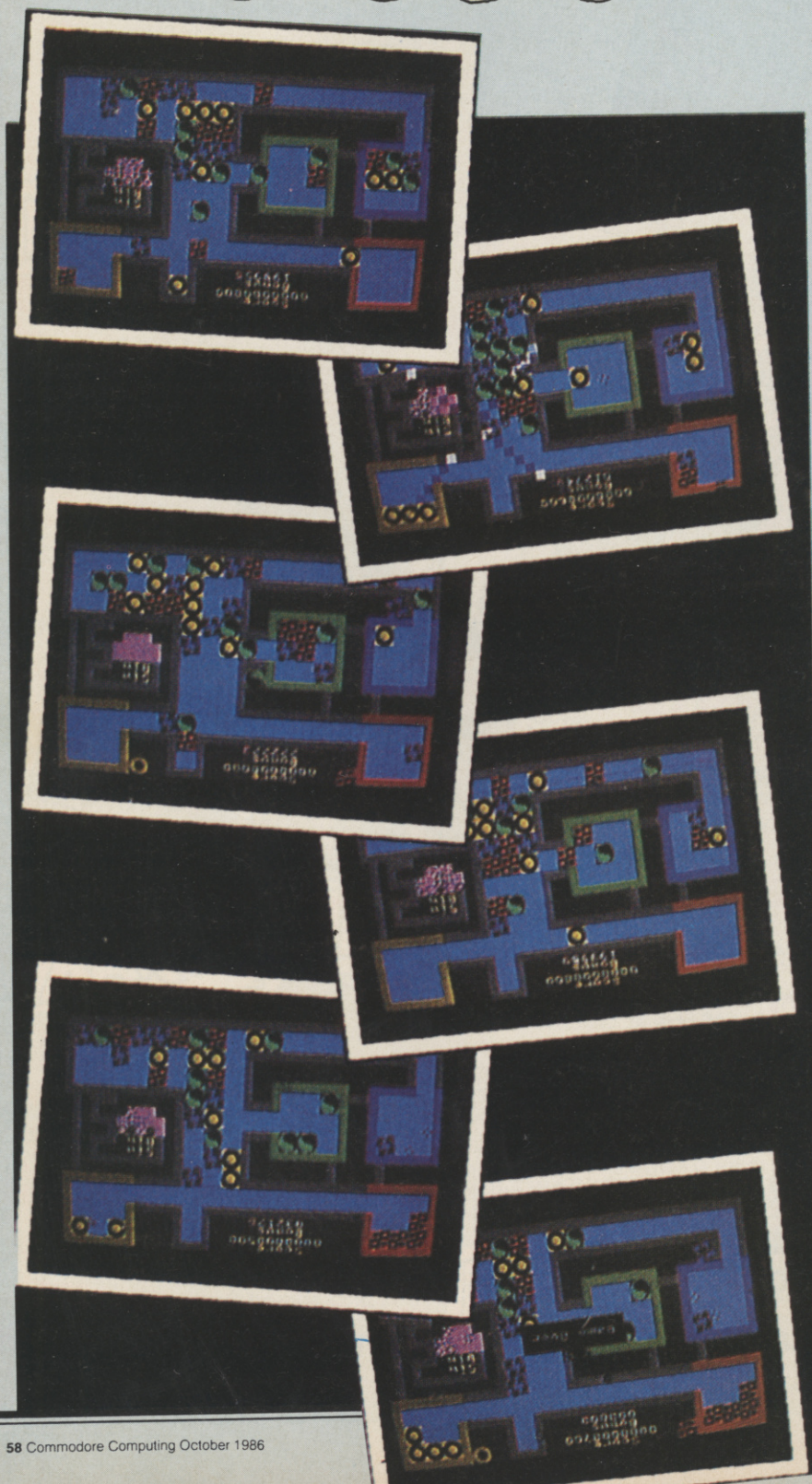
MEGA REVIEW

CCI Rating C16

MEGA

oblido





Oblido is the first in a batch of new realeases from Mastertronic. You are in a maze, and there are four sets of counters, nine in each set. You must jockey the counters to their corresponding depots. There is just one problem to this (well two actually). Firstly there are the 'sinners', these are out to get you, secondly, there is a time limit within which you have to complete your job.

When I say the 'sinners' are out to get you, it's quite an understatement. The 'sinners' are the most vicious little things you could ever fear to meet in a computer game, always firing and bumping into you, reducing your time drastically and escaping from the sin-bin. (Is this ice lockers? Ed) To help deal with this you can fire at them but this isn't as effective as squishing, (squishing? Squishing? what kind of language is that Ed?) them with the counters, this produces a nice, satisfying crunch. (Shouldn't that be squish? Ed. Have you got onamatopeia? Have you seen a doctor? Ed

You are very mobile and are able to move around most of the screen, but I'm afraid the same can't be said of the counters you have to shunt around. These are restricted to the grey paths and so get block up in the passage ways very easily, this means you must carefully work out how to unblock the passage ways or else you'll lose the game.

A fast paced soundtrack beats away in the background and eye catching graphics keep you hooked to the game. I couldn't stop trying to crunch – alright squish these sinners. This game is a steal at £1.99. Get it. Now before it gets you!

Price: £1.99
Graphics: ★★★
Sound: ★★★
Playability: ★★★★
CCI Rating: Mega

TYNESOFT*

*MARKET LEADERS.

Is Tynesoft the northern most of programming outfit in the UK? It seems that this fast growing company in Newcastle is the last outpost of computer creativity before the cold empty desert takes over. Why? Do the more prosperous midlands and south have the monopoly of talent? Not according to Colin Courtney, MD of this thriving specialist software house. "We've recruited a lot of really high quality programmers in the two and a half years since we started. Many were unemployed. But we believe in encouraging local talent. And there is plenty around here."

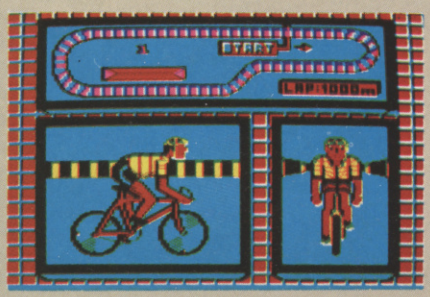
Tynesoft's talent may be local but its impact, however, is far from small. It has solid claims to be the UK leader in software for the bubbling C16/Plus 4 market; machines which in general use the same format, and which now command around 10% of the total UK games software sales.

"We were not in at the beginning of the rise of the C16, but before" Courtney comments. "We'd started with a title on the Spectrum in June 1984, but in December of the same year when the C16 was born we worked closely with Commodore in getting it off the ground quickly. We wrote four classics — Space Invaders, Kong, Pacman and Frogger in six weeks. Commodore couldn't even supply a development machine so we used a 64 for the preliminary work and downloaded the graphics on to the C16 when we got one. If we had not got those titles out, the C16 would probably have fallen flat on its face". Times have changed and no-on can deny that the C16 is riding high with one company after another hurrying to launch old and new titles on to this lively market. Tynesoft alone has 42 titles out, more than any other software house.

He points out that like the video industry, it may turn out to be a quick fading fashion with the result that only one or two companies will be left. "Having found and conquered its niche in the market, Tynesoft is not going to let go or change course. The 64 and Spectrum areas are too flooded with products. They are too competitive " he says. "Although Tynesoft has produced the occasional worth while title for these computers. We go for the 'odd bod' machine; C16, Plus/4, BBC Electron.

MAIL ORDER

Tynesoft chooses not to depend entirely on the conventional computer shop distribution for its software. Courtney, sometime buyer of electronics for a chain of stores, knows the retailers' problems well." The retailer sees the shelf life of a game as six weeks. He's got to stock the top 10 of each machine. He's got to be careful." He points out the retail business fails to cover all needs." In an area of 50/60 miles around Newcastle, there are only *two* computer shops! So mail order seemed the way to move... It takes an awful lot of ad-



ministration, the catalogue and so on, but we now have a very profitable area... We feel it is a service. We have 18,000 customers on our mailing list. We print a new catalogue four times a year. We give special offers in it —about £1 off retail price and a range of other titles coming down from £6.95 to £3.99!" But Courtney insists that all Tynesoft's products are of good quality "100%"; including the latest 'Jet Set Willy II' and 'Who Dares Wins II'.

Courtney is enthusiastic about two new titles about to reach the market; a Plus/4 only arcade game 'Sir Knight' and a Scott Adams Adventure, 'Savage Island I and II'. He says that 'Savage Island is the first real Plus/4 Adventure wth graphics — the same graphics in fact, as the 64 version. Another title that Tynesoft believes is a winner is 'Commonwealth Games'. "May be more successful than the real games", Courtney comments wryly. The C16/Plus/4 version will have six events. "Totally different in quality from what was out on the C16 before. Cycling, weight lifting, swimming, rowing and so on... with large detailed graphics. The weight lifter is virtually full size screen!"

REVIEWERS

Courtney promised CCI readers will get an early look at the 'Commonwealth Games', That's not entirely usual. Tynesoft has generally been reluctant to send out review copies of games. Not because it has doubts about quality but because Courtney believes magazines have approached the C16 games from the wrong direction. "Reviewers compare C16 games to 64 versions!" he growls, "they say things like 'The music is no good!'. What sound there is on the C16 is white noise anyway!." He excepts CCI from the 'unfair' charge. Possibly because another Courtney — CCI's star C16 reviewer, Courtney King is an uniquely dedicated C16 man. Tynesoft's MD believes that reviewers often take the easy way out. "I know time is of the essence... may be it's the wrong reviewer... one who can't get past the first level and says it's a rotten game."

Tynesoft, now 24 programmers and 6 administration staff strong with Trevor Scott, the marketing manager from the beginning, successfully heading the thrust of greater sales in the UK and abroad, does not see itself with limited horizons.

"We are always looking for good programmers and good programs" says Courtney. "We'll even pass them on to another company if they don't fit our plans. We encourage talent..." Tynesoft's own talent had been to find a market where many thought there was virtually no prospect at all. In finding and developing that market, it has become a very successful software company.

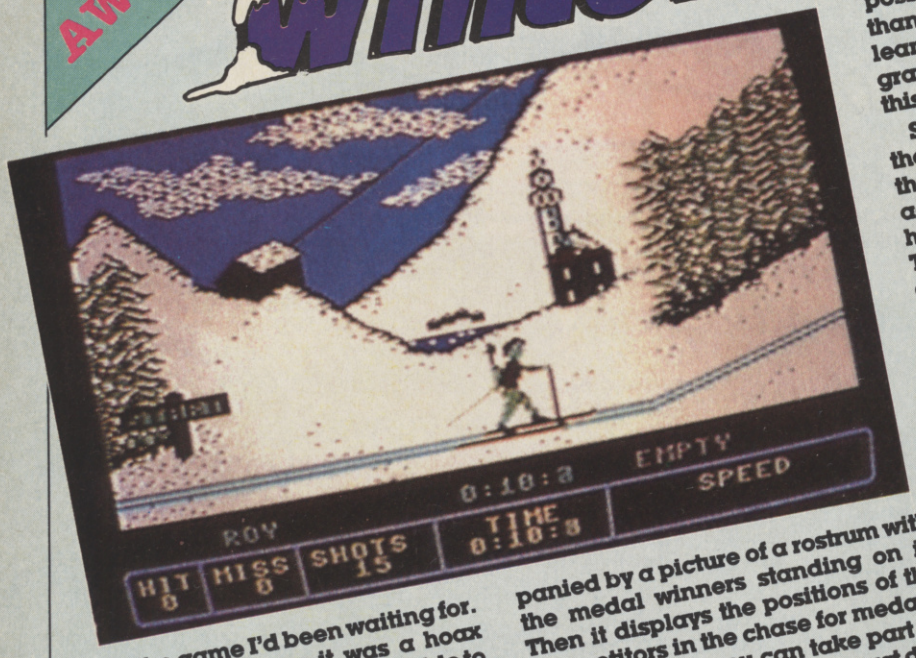
At the same time, Tynesoft has helped provide a great deal of entertainment to owners of good but maybe unfashionable computers. You might call it private profit from public service. There are many worse ways to be successful in the computer business.

MEGA REVIEW

CCI Rating C16

AWESOME

Winter Events



This is the game I'd been waiting for. I'd begun to believe it was a hoax until last month when we were able to preview it. Now we've seen the final version and the wait has certainly been very worthwhile.

You compete in six winter sporting events. These are the biathlon, the bobsled, ski jump, speed skating, slalom and downhill. These start with an opening ceremony and a menu where you can load or save your records, see the current records, practice and compete in all or some events and enter the name and country you play for.

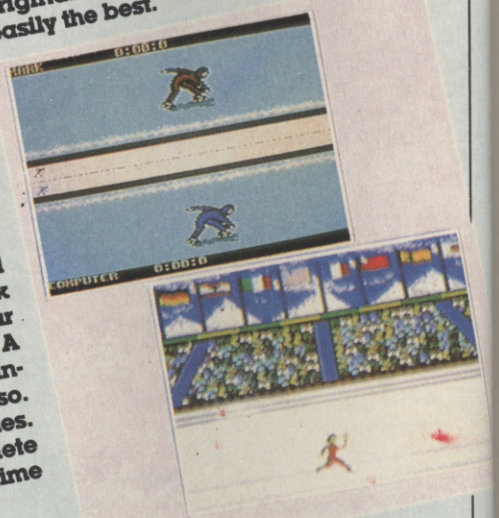
After each event you win, your national anthem is played, accompanied by a picture of a rostrum with the medal winners standing on it. Then it displays the positions of the competitors in the chase for medals.

Of the events you can take part in, the first is the biathlon. You must do a kind of cross country in the snow, ascend and descend slopes and shoot targets. You are penalised for every target missed and at the end you are given both the time it took you to compete the course and your full time including your penalties. A hard event to master, yet still retaining a challenge once you've done so. You'll really want to try it many times.

In the bobsled, you must complete a very twisty course in the fastest time possible. This is much more difficult than it sound because you have to lean into the tight corners. Great graphics and a long course make this game very appealing.

Speed skating – this is arguably the worst event in the game and even this is great! You can play either against a human opponent, if you have two joysticks, or the computer. This gives it an edge over the same event in the 1964 Winter Games.

Ski Jump – this is a top favourite of mine. You must go down the ramp and take off. The picture then switches to two large pictures of a jumper (no, not clothing, a ski jumper). One depicts the posture you should take, the other is your actual stance. A very original version of this event and easily the best.



The 1st two events are the skiing ones, the downhill and slalom. They are excellent. They show a view of the skier from behind. Flags and trees fly by you, patches of ice send you off course and if, in the slalom, you miss three flags you get disqualified.

This game is brilliant. It has excellent graphics and sound by Udo and Briggete Gertz and is by no means just a straight copy of Winter Games. Anco deserve a big round of warm, non-wintry applause for this one. *If you don't buy this game you'll regret it.*

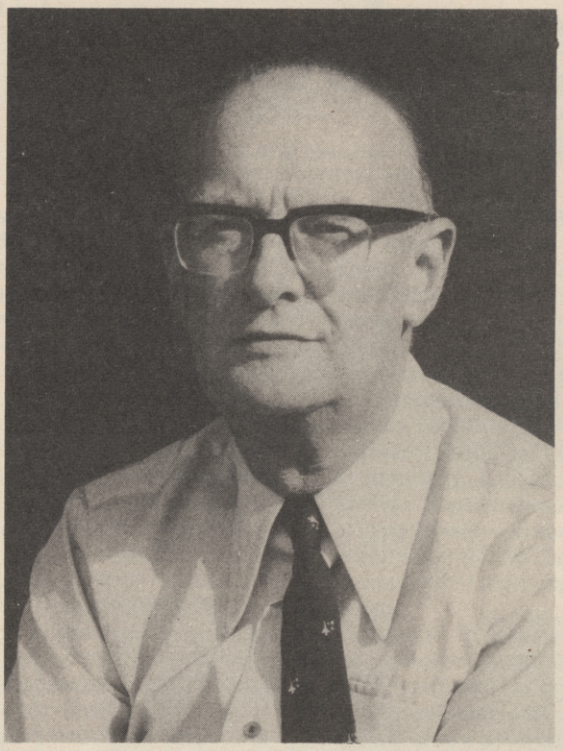
Price: £7.95
Graphics: ★★★★★
Sound: ★★★★★
Playability: ★★★★★
CCI Rating: AWESOME

AMIGA IN PARADISE

The Amiga is attracting a lot of attention from those who keep up to date with new technology, and from those who like to own that technology! It is a measure of its state of the art possibilities that even the people who tell us what the future will be find it fascinating. Arthur C Clarke, world-renowned science-fiction writer, author of '2001 A Space Odyssey', and many other science based fiction and non-fiction books is privileged to be one of the few private individuals to own not one, but TWO Amigas.

Clarke is an avid new-technology fan, and follows developments very closely. When 2010 was being previewed in Hollywood, he heard rumours about this amazing new machine. After a little investigating, he found out more, and was all set to go out and buy one. Clarke lives part of the year in a technology packed hideaway in Sri Lanka. Unfortunately, only NTSC (US standard) models were available, so there followed a long wait for the PAL version to be released. He placed an order with his Colombo dealer and sat down to wait. Clarke waited and waited none too, patiently for this new technological bob. A few weeks ago he flew over to England, still Amigaless, and, as you would expect, a message reached him the 'thing' turned up a week after he'd left! His office staff managed to set it up and were enthusing over it to him down the phone. So, full of determination actually to use one of these machines, he got in touch with Rod Eva of Y2 Computing, who are also Amiga dealers, and borrowed one. He liked it so much, he bought it, so he now has an Amiga in his Colombo home, and another in his Somerset office.

Clarke had never used a WIMP (Window Icon Mouse) machine before the Amiga, athough he had seen an Apple Macintosh which he hadn't purchased because of its lack of colour. He has a variety of computers, including an Apple II, an IBM PC, a Kaypro II (which was used to write 2010), and a Hewlett Packard. He is also very much into telecommunications, and sends all his work down the line, via satellite, to the US and to England. All his books are now written on word processors, and the one thing he seemed most annoyed about was their lack of a really good WP for his Amiga. Unfortunately, he has been rather let down by some of his equipment, namely that from Miracle Technology. He has several WS2000's ad a WS3000 (modems), none of which at present work! This is rather strange, because Miracle has a good reputation for producing reliable equipment (see the review of the WS4000 in the next issue).

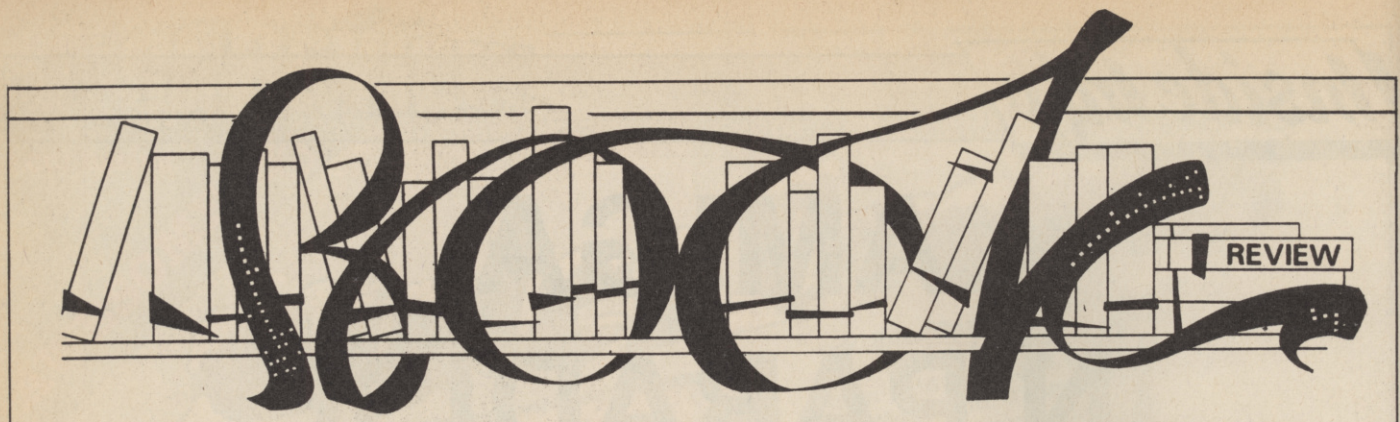


Arthur C Clarke

Now that he has an Amiga, he plans to use it in to word process on, as soon as a decent WP is available that is! Up until now, he hasn't bothered to learn how to program, but after seeing the power of the Amiga, and the ease with which one can program it from Basic, he intends to start dabbling in programming. What impressed him most about the Amiga were the graphics, and Graphicraft, the art package bundled with the Amiga in some countries particularly took his fancy. Commenting on the fact that Commodore are trying to get the Amiga into the office, he said he thought that "if office workers got their hands on an Amiga at work, there'd never be any work done; they'd all be playing games!" Not probably a highly encouraging reason for businesses to buy it, but probably to a certain extent true. After all, if Marble Madness started to get around the office, lunch-breaks would probably double in length! The game has certainly caused a disruption in this office...

Although Arthur Clarke enthuses about the potential the machine has, he remains sceptical as to whether it will succeed. In a line of thought similar to many people in the industry, he is not too impressed with Commodore's marketing skills, and was rather shocked at the price difference between the UK and the US (almost double in the UK). However, he eagerly awaits the launch of the Amiga II, details of which are starting, slowly but surely, to leak out. It could be immediately added to the future predicting genius stock of computers in the island sometimes called Paradise.

J.R.



Superbase—The Book

SUPERBASE: THE BOOK by Dr. Bruce Hunt is the book which I predict will become a Commodore classic along with the Programmers Reference Guide and Rae West's books. Most readers will have heard of, if not purchased Superbase for their machine. This sturdy piece of software has now reached the dizzy heights of over 100,000 copies sold world-wide which must qualify it for the most successful applications software in the Commodore sphere. Although Superbase is relatively easy to use, its true strength of character lies in its flexibility in applying it to a database problem.

Database users expect a certain number of basic elements, these include; a means of setting up the data entry forms, in other words a data description language. They also need a data manipulation language as a means of sorting, merging, editing and manipulating the files, a query language for generating applications by chaining together files and commands, a way of restructing the database once created without losing data, some method of producing reports and labels or other printed output, and finally a means of batch updating the records. Superbase remains the only database able to fulfill these elements without compromise, indeed the constraints are those relating to the hardware as I pointed out in my review last year in CCI.

Such software retains a loyal band of followers who have long demanded a book dealing specifically with Superbase. The nearest this ever got to in the past is the continuing series of articles in the ICPUG Journal. Precision Software Ltd., the originators of Superbase finally persuaded (?!) Bruce Hunt, their marketing manager to produce the product. This book marks a number of 'firsts', it is the first book on Superbase, it was the first book to be published by Precision Software and it also Bruce Hunt's first published book. Is it any good? My answer is an unqualified YES.

The book is split into four sections, the first deals with setting up a system, the second with simple programming, the third brings out Superbase programming at an advanced level, whilst the final section covers troubleshooting and error recovery.

Existing users of Superbase make few complaints about the quality of the manual supplied with the software, original objections to a lack of an index were quickly rectified. This book represents an extention to the user's manual. But and it could give you a detailed insigh into what Superbase is about without committing too much money. If you decided to buy Superbase afterwards, the book would really become valuable.

The first part identifies the classic database trap for the unwary or inexperienced, namely file design. One may well all fall for that when one first gets hold of Superbase. I have a feeling that my first grandiose scheme was for a database of books that had I thought it through would have rivalled the catalogue system of the Public Records Office and needed a CRAY-II supercomputer to run it. Happy days! The author spends many pages going through file design, which is not simply screen design, but user requirements from a file structure, which type of fields are more suited for searches, menu construction. It is clear the author knows his stuff on database management systems. Really will find this section the most interesting since it deals with tangible concepts affecting everyone. You will probably find yourself reading this section over and over again, such is the quality of knowledge offered in it.

The second and third sections deal with the esoteric aspect of Superbase, namely the programming. The problems are really related to lack of planning and in all fairness to the author, he faces an uphill task in trying to teach the programming language. What these two sections conveyed to me were how to find the rails and remin on them during the building of a program, rater than providing page after page of listings. We are led through the command line which is the first step to getting under the Superbase bonnet, and then on to short, succinct ten or twenty line programs which are heavily commented or explained in detail.

The final section on troubleshooting is the culmination of many years of technical support information collected, collated and expanded by the redoubtable Brian Leighfield, Precision's technical support manager. In fact this section could well be placed into an 'expert system' and easily marketed by Precision! It was this section that gave me the most interest, for it not only covered answers to error conditions that occur during the use of Superbase, but bravely discussed the bugs afflicting the various versions of Superbase. There can't be many software houses that have the courage to admit in print that their product has bugs, but as most readers will know, the perfect bug-free software has yet to see the light of day. The manner in which this is done is intended to eliminate the possibilities amongst the software, hardware and organicware (the user!) of who is at fault during a system glitch. This section covers not just the versions of Superbase which have the bugs, but also which machines are affected by them.

In about 200 pages Bruce Hunt slakes the everpresent thirst for unique material. A well written book on a fascinating subject and a genuine addition to the pool of knowledge on Commodore matters, all the ingredients for a classic book on a classical subject.

B.D.

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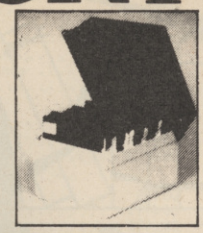

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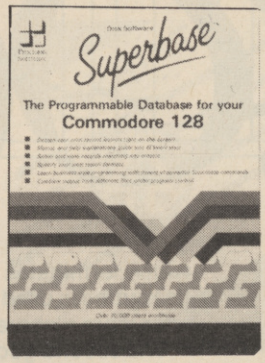

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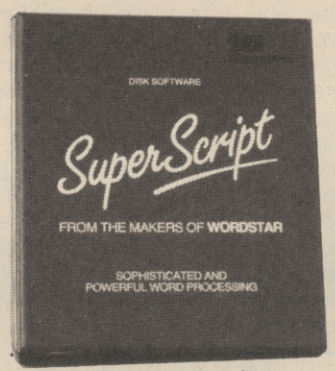

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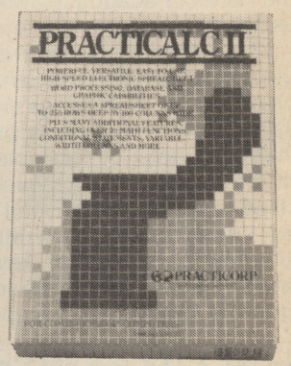

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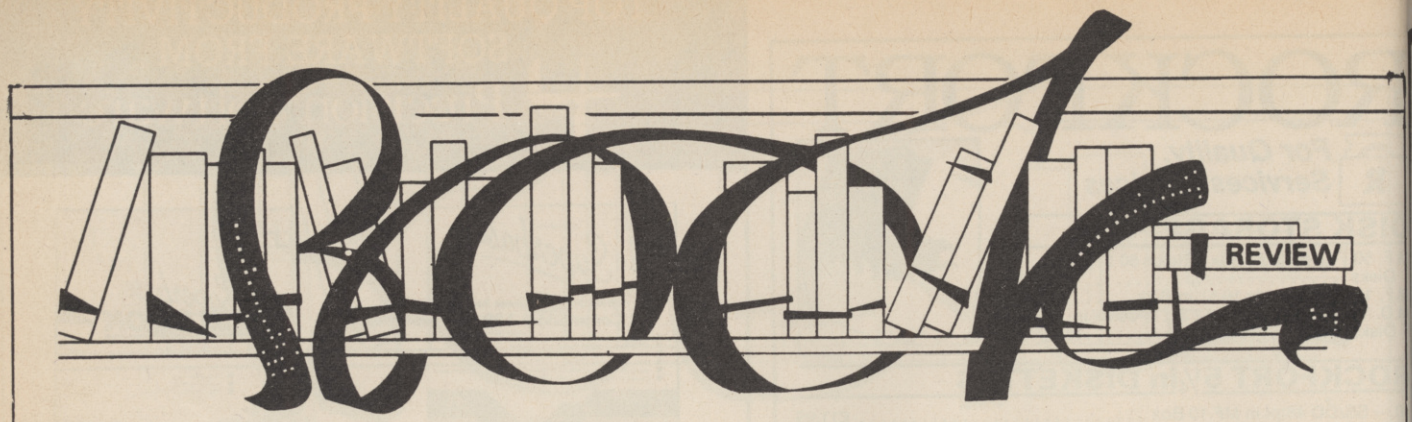

MACHINE LANGUAGE FOR THE COMMODORE 64 AND OTHER COMMODORE COMPUTERS
Jim Butterfield, Prentice Hall

This book is simply the best book I have read on the thorny topic of machine code. Any author who can get me to understand what is going on in a machine code program would deserve the Perfect Pedagogue award, but Butterfield's book actually got me writing it!

The reason this is such an excellent teaching book lies in the structure of the presentation. Two things are important here. First the course is practical . . . there are lots of example programs which are not Mickey Mouse type exercises, but really quite useful routines . . . e.g. by page 57 you are writing a routine to detect if a number key has been pressed and write it on the screen, while ignoring other keys except Run/Stop which terminates the program. This little routine is used as a building block in later more elaborate programs.

The second good aspect of the structure is the order in which machine code instructions are presented. The sequence corresponds to the requirement of practical applications. For instance, you will be introduced to the Kernel routine to output a character in the second chapter of the book. This may seem to be a very early stage to introduce the idea of calling ROM routines. However, you need this if you are to achieve the practical and useful goal of writing the machine language program to output a number in Chapter 3.

The book is pitched at an introductory level, without being puerile. Binary, dernary and hexadecimal notation is quickly covered without the sort of 'see here you mental cripple you . . .' approach of some other books. Butterfield assumes that, as an intelligent amateur, you want the specifics, not tortuous analogies.

Butterfield's book is well paced all the way through and must be based on a very successful classroom course.

Complaints? Well not really. The book is written to cover a range of machines, but the C64 is the main beast in the cage. The Vic intrudes occasionally, but I just crossed out the offending parts of the text and found no problems. There is also a lot of technical bumpf in the appendices which make up half the book. Most of this repeats information available elsewhere, but often set out in a very accessible way. I would have preferred more text instead.

You will find the headings and diagrams very helpful in locating details, and the index is designed to help you access the fund of information, rather than to keep some awkward editorial assistant out of the bosses' hair. The programs you key in are short, and, wonder of wonders, they actually RUN! Rather than give you heaps of programs to copy, Butterfield provides lots of suggestions about how you can modify and extend the short routines he has listed.

For a book of this quality — good paper and excellent binding, £10.95 is cheap! It represents far better value than the number of £6.95 books that I bought on subject and never finished!

If you do as you should and buy it, be prepared to discard any other books you have on Machine code. When you start to do the exercises, you can be sure that the examples all work. The only error I found was in a basic print statement which had three quote marks, see line 140 on page 106 . . . hardly the sort of thing you're likely to come unstuck on. The only other misprint I saw was a lower instead of upper 'a' in a .Assemble instruction on p. 87.

A great book least times they are a changing . . . How about an updated edition Mr Butterfield?

Neil Day

THE ANATOMY OF THE 1571 DISK DRIVE
by First Publishing Ltd — £12.95

If you really want to master your computer, you will also need to master its peripherals. The 1571 Disk Drive book is the kind of book that will help you achieve just that. It is aimed at both the beginner and the advanced, although it will probably be of greatest use to the latter. The book covers almost everything from 'This is a disk' to modifying the WD 1770 controller chip circuitry. The greatest proportion of its five hundred pages (about two thirds) is dedicated to the 1571 ROM listing (disassembly) with the 1570 differences documented seperately. The ROM listing which is broken down into its relevant routines is very well annotated. It has a nice cross reference feature, which allows the reader to see from where in ROM any particular routine was called. This should save hours of backtracking. Many people will have been attracted to the 1571 by all the sales hype about the marvellous things it will do. How it will read numerous disk formats, how it can operate at far greater speeds in wonderful new modes etc. It's all true . . . but, did the salesman tell you HOW to make it do these wonderous things or maybe give you a book which would explain it all? No! I remember playing for hours trying to figure out how to format a disk in anything other than Commodore format. Reading foreign format disks was just as much fun. When this book arrived I knew things were looking up. Not only does it explain how it all works but it even gives you some listings you can type in which will actually show you it in action.

Conclusions:

It is well laid out and covers all aspects of the 1571 to a sensible degree. The ROM listing is a must for anyone interested in any serious disk manipulation. The type-in examples are short and functional. I can now make my 1571 do all those things the glossy pamplet said it would do. I think it may be a little over the head of some beginners but will most definitely find a niche on the bookshelves of many of the more experienced programmers.

I can also recommend First Publishing's 'Anatomy of the C128' another nice book, which also includes a ROM disassembly.

Ian Bennett

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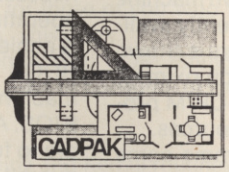

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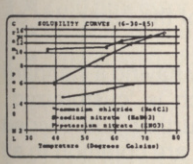

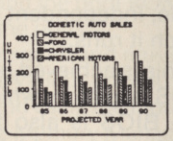

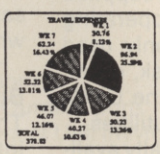

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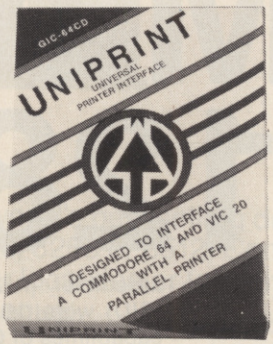

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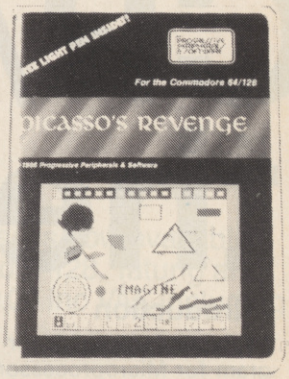

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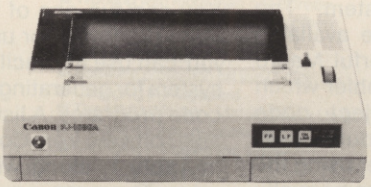

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128

CP/M and the 128 Part I

Introduction

CP/M, which stands for "Control Program for Microprocessors" is the resident operating system of the Z80 microprocessor in the C128. The C128 has three modes of operation, a C64 mode running BASIC 2.0, a C128 mode running BASIC 7.0, and a Z80 mode which does not have a resident language. CP/M is not a high-level language. It is an operating system which executes user commands. CP/M allows you conveniently to use all of the hardware resources provided by the computer.

CP/M can run many thousands of commercially available programs. Some of these are available from CBM on CBM GCR format disks. The vast majority are only available on MFM format CP/M disks. It is necessary to use a 1571 if you wish to run software
or have the software supplier transport the software you require to a CBM compatible disk. There is usually an extra charge for this service, and not all software suppliers are willing to do it.

CP/M is also a comprehensive machine development system. The standard utilities, which are available from CBM, include a powerful Macro Assembler (MAC), an assembler which produces relocatable object code (RMAC), a relocatable module linker (LINK), an object code loader using the editor (ED) or one of the commercially available wordprocessors, and assembled into object code using MAC, OR RAMAC if relocatable code is desired. These object code blocks are then linked together using LINK, and a machine code .COM file created using HEXCOM. The process is easier than it sounds, everything being thoroughly explained in the documentation with numerous examples.

History

The CP/M operating systems was created by Gary Kildall. While working as a consultant for Intel, Gary wrote the first high-level language compiler produced by Intel, PL/M. Then, in 1974, he created his first version of a CP/M file system. This supported a resident PL/M compiler. CP/M first appeared in 1975 when the first licensing agreements were entered, but went almost unnoticed for over a year. During this period, the early versions of the editor (ED), the assembler (ASM), and the debugger (SID) were developed. Since then the capabilities of CP/M have continued to expand. The system can now support up to 16 disk drives of up to 8Mbits, up to twelve peripheral devices such as printers, and bank-switched memory. CP/M systems have beendeveloped for various eight bit microprocessors such as the 8080, 8085, Z80 and others.

What CP/M does

CP/M controls the computer's resources, such as memory, disks, screen, keyboard, printer, and other devices. It also controls the disk system by grouping information into programs or data files. CP/M can copy files from memory to disk or printer. To do this, CP/M places programs in memory and runs them in response to input from the keyboard or another disk file. The minimum system has one disk drive. To use all the capabilities of CP/M, you should have two disk drives (I use a 1541 and a SFD1001).

There are two ways of using CP/M. You can run one of the many applications programs for use under CP/M, or you can use the facilities built into the system for generating your own machine code programs. A list of currently available software from Commodore is shown in Table 1, along with an approximate price. There are many more CP/M programs available from other sources.

CP/M and its utility programs come on two disks. The system disk, supplied with the C128, contains the operating system and the most commonly used utility programs. A second disk, obtainable from CBM along with the CP/M manuals, contains additional utilities.

If you want to run commercially available software, you do not need the second disk and the documentation. On the other hand you want to write your own programs in machine code, or, gain a greater understanding of how CP/M works, then the Utility Disk and documentation available form CBM (see list of available software) is essential.

How CP/M is organised

CP/M resides in the file CPM+.SYS, which is loaded into memory by the system loader during system initialization. The system loader is part of the Z80 ROM. The Z80 ROM is situated at $D0000 but is made to appear to be at$0000 to $4000 in BANK0 by the memory management unit (MMU) chip. CPM+.SYS contains the distributed Basic Disk Operating System (BDOS), the Basic Input/Output System (BIOS) and information indicating where these modules are to reside in memory. The machine specific routines of the BIOS are in the Z80 ROM.

The file which provides the basic user interface to the facilities of the operating system is the Command Control Processor (CCP.COM). This is loaded into the Transient Program Area (TPA) of memory by the BIOS after it has loaded. The CCP contains the Program Loader Module, which loads transient (applications) programs from disk into the TPA for execution. The CCP provides six built-in commands, these are listed in Table 2.

The commands in the CCP are called resident commands. All other commands, and certain options of the resident commands, require a .CP, file to be loaded into the TPA and executed to perform the command. The transient commands supplied on the CP/M disk with the C128 are listed in Table 3, and those which can be obtained as part of the CP/M Ultilities from CBM in Table 4.

CP/M uses eight character filenames, and a three character filetype . You may use any three alphabetic characters for the filetype, but CP/M requires certain filetypes for some of the commands. The filetypes which have specific meaning for the system are shown in Table 5.

How CP/M is implemented

In order to allow applications programs to run on many different computers, it is necessary for the 'program side' of the operating system to stay the same. This is achieved by keeping the CCP and the BDOS standard, and having all the machine dependent functions in the BIOS. Also, if the applications programs are to function in a uniform manner, the overall BIOS structure must also be the same, independent of the computer on which it runs.

This is achieved by having a standard BIOS skeleton which is 'customized'. The BIOS is also further sub-divided into functions which are common to all systems, but must be tailored to the individual machine, and those which are heavily machine dependent. This is further complicated in the C128 by having to have a set of driver routines to manage the interface to the 8502. In the C128, the BDOS and standard BIOS routines are on disk in the file CPM+.SYS, while the machine dependent BIOS functions, the CP/M LOADER, and the 8502 drivers are in the Z80 ROM. The Operating System Modules are listed in Table 6.

The BIOS data structure CHRTBL is a character table describing the physical

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- Using the interrupts
- Assembly language programming and Kernal routines
- Z-80 processor and the boot ROM
- Peripherals and the ports
- Programming for sound and music
- Programming the various graphic modes
- Understanding and using the Input/Ourdoor ports
- Programming the Memory Management Unit (MMU)
- Using the 80-column chip
  - getting 640 x 200 point resolution
  - getting more than 25 lines on the screen
  - smooth scrolling
  - copying blocks in screen memory
  - character length and width management

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Tricks and Tips for the C-128 is a tremendous treasure trove of programming techniques and 'tricks' for every C-128 owner. This book not only contains plenty of example programs, but also explains in a simple to understand manner the operation and programming of the computer

Contents include:

- Graphics on the C-128
- Working with more than one screen
- Graphics with the 80 column screen
- Simulating multiple windows
- Listing Converter
- Software protection on the C-128
- Changing the keyboard
- The MMU (Memory Management Unit)
- Important memory locations
- Changing the operating system
- Sprite handling
- Custom character sets
- Autostart
- The 80 column controller
- Modified INPUT
- Line insertion
- Banking
- Kernal routines
- Key pad in C-64 mode
- C-64 mode of the C-128

The Anatomy of the 1571 Disk Drive ..

Following the unprecedented success of the 1541 Disk Drive Book – Data Becker and First Publishing are pleased to launch this new definitive guide to the 1571 Disk Drive.
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I/O devices. CHRTBL contains 6-byte physical devices names and the characteristics of each physical device. These characteristics include a mode byte, and the current baud rate, if any, of the device. The DEVICE utility references the physical devices through the names and attributes contained in the CHRTBL. The logical devices recognised by the system are summarized in Table 7.

CP/M can support up to 16 disk drives, labelled A to P in commands. The Drive Table is initialized for four drives, A to D, and a virtual memory drive, E. Drive E shares the characteristics of drive A, as it is intended to function with a single disk as Drive A. When an external memory extension is fitted, it can be used as a RAM disk, drive M. The logical drives recognised by the system are listed in Table 9.

Disk Formats

There are three CBM formats and six MFM formats which are supported. Of the CBM formats, one is only intended for compatibility with CP/M 2.2 on the C64. The remaining two are C128 single sided and C128 double sided. The last is only available on the 1571. Commodore state that this is the case in the C128 Programmers Reference Guide, this is not quite true. It is possible to use C128 Double Sided format with any CBM double sided drive. (This is because the FORMAT.COM utility automatically assumes that any drive which is not a 1571 is a 1541. This is very frustrating if the drive in question happens to be a double sided SFD1001 with a 1MByte capacity! The file can be modified, however, fairly easily to allow the last option which gives 340kBytes instead of 170kBytes, which is better than nothing.) Another limitation is that the CP/M version supplied does not support drive 1 of a double disk drive! Good news however, a modified version of CP/M which does support the second drive of a dual disk is available in the USA in the public domain, i.e. free of charge! This has reached the UK via ICPUG. If you want a copy and are not a member of ICPUG, you can obtain a copy from Brain Boxes for a nominal handling fee (Tel: 051-220 2500).

C64 Single Sided sets up the disk as 32 tracks of 17 sectors each and a track offset of two. The BIOS adds 1 to all tracks greater than 18 (the 1541 directory track).

C128 Single Sided sets up the disk as 638 tracks of one sector each and a track offset of zero. C128 Double Sided sets up the disk as 1276 tracks of one sector each and a track offset of zero. The following algorithm is used to convert from the requested track to the real track and sector number.

REQUESTED TRACK	ACTUAL TRACK
000 >= TRACK > 355	((TRACK +2)/21)+1
355 >= TRACK > 487	((TRACK—354)/19)+18
487 >= TRACK > 595	((TRACK—487)/18)+25
595 >= TRACK > 680	((TRACK—595)/17)+31
680 >= TRACK > 1360	SET SIDE 2 TRACK=TRACK-680

MFM is supported on the 1571 only. The formats supported are:

Epson QX 10	(512 byte sectors, double-sided, 10 sectors/track)
IBM/8 SS (CP/M 86)	(512 byte sectors, single-sided, 8 sectors/track)
IBM-8 DS (CP/M 86)	(512 byte sectors, double-sided, 8 sectors/track)
KayPro II	(512 byte sectors, single-sided, 10 sectors/track)
KayPro IV	(512 byte sectors, double-sided, 10 sectors/track)
Osbourne DD	(1024 byte sectors, single-sided, 5 sectors/track)

Note that YOU CANNOT FORMAT MFM DISKS ON THE 1571! If you want to use MFM seriously, you must get your disk supplier(!) to format them for you.

Continued in the next issue

CP/M Memory Organization

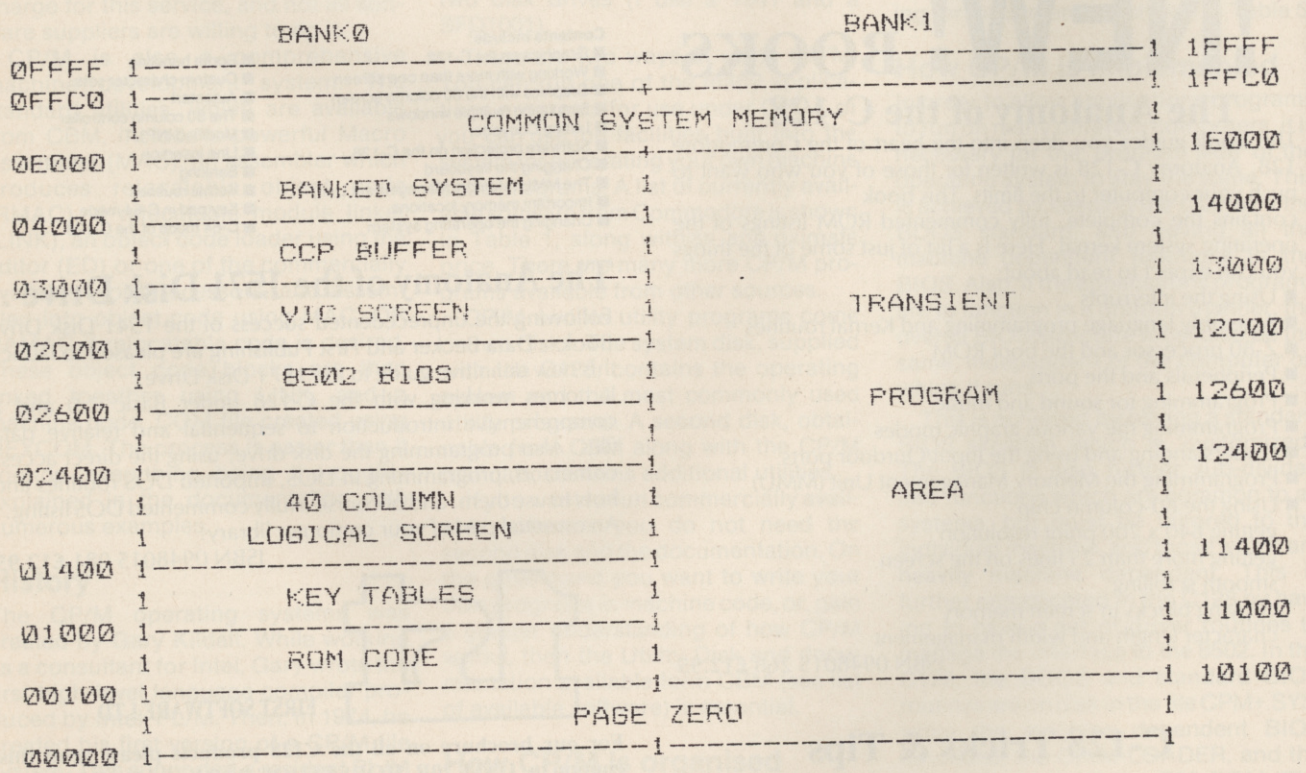
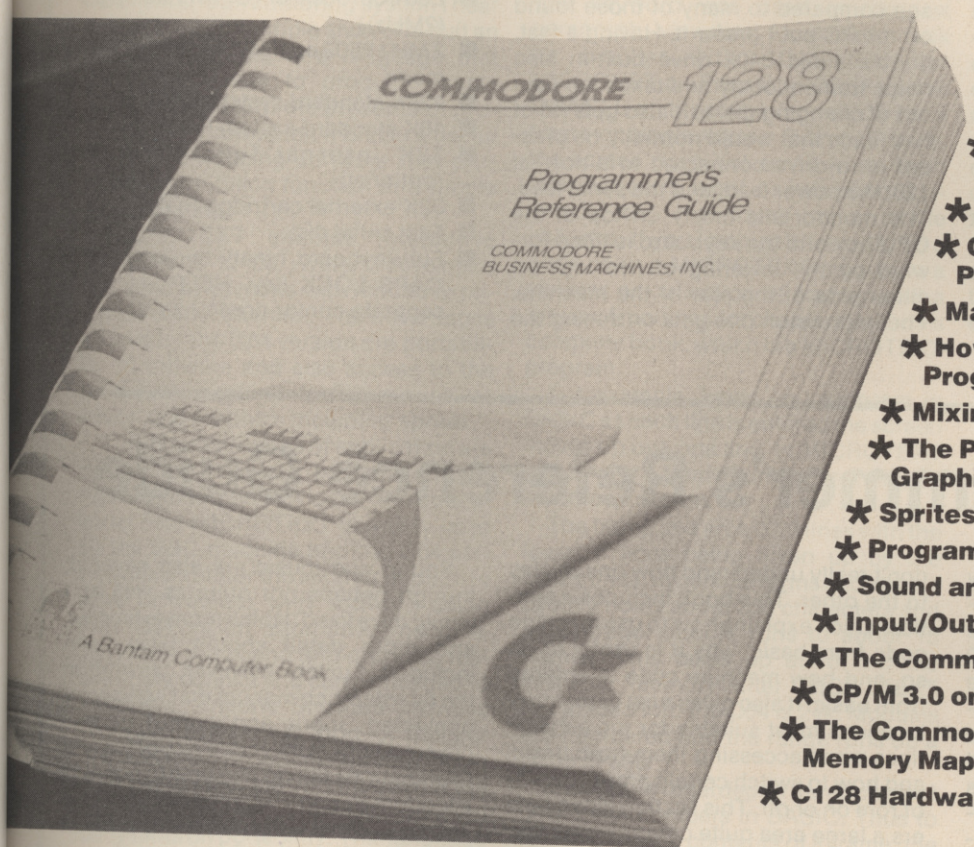


Table 10 CP/M System Memory Organisation

C128 Programmer's Reference Guide

This is a very important book.

Its 742 pages are crammed with information that no serious 128 user can afford to be without.



Contents

- ✱ BASIC Building Blocks and Basic 7.0 Encyclopedia
- ✱ One Step Beyond Simple BASIC
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A LOOK AT THE 128D

The 128D is to all intents and purposes, a 128 with a built in 1571 disk drive. It comes in an attractively designed case, with a separate keyboard that can be lap-held. Unfortunately, in their wisdom Commodore made the lead between the CPU box and the keyboard a solid, and fairly unflexible thick piece of flex. It is also too short. Why, when they are producing an Amiga machine with a lightweight keyboard on the end of a coiled flex they did this is known only unto themselves. Funnily enough, when you pick up the 128 it seems to weigh a lot more than the Amiga! These rather minor grumbles apart I find the 128D an excellent machine easy to use especially with Vizawrite Classic 128 which is used to write all my articles. We have used a 128D now for several months. It is solidly built, and has managed successfully to withstand the regular office knocks and bangs that it receives in the course of its duty from day to day. It even has a carrying handle, although it is rather heavy. The keyboard clips neatly into place underneath the CPU box, and the handle folds out from the left hand side. Unfortunately there are no slots for disk storage but I think the number of occasions when the machine will be shifted more than a few metres are so few that they are probably unnecessary to all but a few users.

The 128D is fully compatible with the 128 because it is exactly the same computer. It still retains 64 mode and CP/M mode and, of course the resident 128, 40 and 80 column modes.

I use the 128D in preference to the PC's we have in the office for word-processing. Vizawrite Classic 128 is such a powerful and easy to use package compared to many of those found on the PC but I prefer it. Having a fast, double sided 340k drive built-in also helps tremendously and takes the pain out of changing disks. It also gets rid of two leads that would normally be present on a drive connected to a normal 128; the power lead, and the serial lead. The monitor sits nicely on top of the CPU box and the keyboard is tilted forward by the lowering of two legs on either side of the rear of the machine. The impression one gets on seeing the 128D is that of a professional, well designed machine, and with decent business software it would sit very nicely beside PC's and other much more expensive business micros.

For more information on the C128D, contact the information desk at Commodore (UK) on Corby (0536) 205555.

- C64 compatibility
- 80-column display capability
- Z80 coprocessor (CP/M version 3.0 (2MHz))
- 2 MHz 8502 operation in 80-column mode
- 128K standard system RAM
- 48K standard system ROM
- 32K internal function ROM (optional)
- 32K external cartridge ROM
- Fast serial disk
- Full keyboard, ninety-two keys with **CAPS LOCK** key, **HELP** key and separate cursor-control keys.

128 Programmer's Reference Guide

There can't be many computers below £1000 that are as technically complicated and intricate as the Commodore 128. Counting the two 128 modes (40 and 80 columns), the 64 mode, and the CP/M mode, it has four modes of operation, two dedicated graphics chips, two processors, a custom sound chip, and two different basics. To cover all of this in depth, a book of mammoth proportions would be required. Bantam Computer Books brought together nine of the people who most influenced the design of the Commodore 128 and between them they have managed to produce a 744 page epic about this machine.

The book covers all four modes in depth, packed tight, with information, especialy 128 mode. It lists each instruction step by step and explains its syntax and gives examples of use. This leads on to a short machine-code course, including an instruction set list for the 128's processor. At this point people generally start getting confused. They see basic, and they see machine code, but don't really understand how one relates to the other. This book includes a section which explains how to use machine code from basic, why it is useful to do so, and how machine code is entered from basic. It also gives a list of memory locations must suitable for mc subroutines when accessing them from basic, and how to switch certain areas (banks) of rom on or off. This section alone covers a large area quite comprehensively, and it was refreshing to read text about machine code that wouldn't be gobbledegook to the beginner.

The book deals very extensively with the 128's graphics both from basic and m.code. It covers too an area very much neglected by other manuals, and by Commodore themselves, the 80-column graphics chip (called the 8563). What is revealed is a very powerful graphics chip with 16k on-board ram for screen data and 37 internal registers. This too, like most subjects in the book, is looked at closely. In fact 43 pages are devoted to the 8563, showing just how important a part of the 128 it is.

Sound and music are also covered, though pehaps not quite as well as I would have liked. I think more examples, and more detail should have been included. Luckily however, an area in the 64 reference manual that was sorely neglected, input and output is well covered here, with ample examples and explanations telling you how to connect a modem or non-Commodore printer to your 128 (something that is very difficult unless you know how).

The biggest section of the book is devoted to the 128's operating system, the CP/M OS, the C128/C64 memory maps, and a hardware specification section. In other words, a real hacker's delight. Almost everything you could possibly want to know is covered here; little is left out.

This really is one very good book, and by far the best I have yet seen trying to look at the 128. Where others fail, The C128 Programmer's Guide succeeds. Recommended without reservation to anybody who owns, or is buying a 128 or 128D.

Product Update

MICROTEXT 64

MICROTEXT is an authoring system devised by the National Physical Laboratory for use on microcomputers. The version described in this review is for the C64 and has been implemented by Ariadne Software, the providers of the COMPUNET systems software and the BITSTICK graphics package for the BBC. What is an authoring system I hear you all cry? The simple answer is that an authoring system is a language that allows beginners to produce usable software and learn the precepts of programming a computer, it is also a useful route to producing software that provides a form-filling function or a simple expert system.

MICROTEXT enables interactive applications to be written, developed and used by persons with limited experience of the machine. The advantages offered by the C64 version are portability of software and also access to the individual machine facilities such as sound and graphics including sprites.

The four main areas of application are Education, Training, Information Retrieval and Expert Advice. In the educational field MICROTEXT is widely used on the BBC machine and the C64 version allows either the teacher or pupil to write or interact with software using their C64 as an alternative machine. Obviously the sound and graphics features may conflict and care is needed to avoid this. Ariadne Software provides cable and software to 'port' or transfer MICROTEXT programs directly from machine to machine and thus avoid the disk format problem as well as providing many hints on portability. This language allows for the user's ability by adapting and modifying the level of presentation easily since programs are very simple to write.

In the training context the creation of simulations or instruction sequences are simplified because the construction of branches is versatile and simple. These facilities are clearly seen in the information retrieval sphere since the branching is done on keywords defined by the programmer and given the graphic character facilities of the C64 a 'Viewdata' type system can be utilised with extremely fast search times. For an expert system the ability to link modules together coupled with a front-end designed by the programmer makes MICROTEXT a cost-effective approach in this field. Please do not get the idea that MICROTEXT is meant for those with a mental age of less than five years, it is capable of supporting a system to the highest level. Ariadne Software is currently working on the AMIGA version of MICROTEXT.

So what does MICROTEXT look like? The keyword was used in the last paragraph, 'viewdata'. Most readers will be familiar with COMPUNET or MICRONET on Prestel, or CEEFAX and ORACLE on the television, which use a frame or single screen format. That is, the screen does not scroll when fresh information is input or refreshed (updated), but the frame as a whole changes. If you imagine a frame to be a page, then a MICROTEXT module is a chapter or collection of frames, and a group of modules (or chapters) is then a complete book, which is a MICROTEXT program.

For example, when you program in BASIC as each line is entered the screen moves up one one line. In MICROTEXT you ask for a frame number and work in a frame or screen.

The frame text area is 23 lines with the lower 2 lines being taken up by the status lines. In general terms each frame usually holds about 330 characters and an average module runs to about 15 frames. This takes up about 5k, the available memory after MICROTEXT has loaded into the C64 is 24k. Modules are numbered and the range runs up a value of 999.

Frames are regarded as the equivalent of the line numbers in BASIC. Thus to find and list the contents of a frame, the syntax FRAME 'n' is used, but the system is inherently more flexible. For instance, frames can be copied and commented, the whole structure of program text handling is directed towards the user rather than the machine. The natural volume to deal with is a frame or screenful of material at once, rather than scrolling through a program.

The documentation supplied with MICROTEXT runs to 120 pages and is very comprehensive. The author writes in an assured and helpful manner with plenty of tips given for the new user and old hand alike. There are 3 appendices in the manual, the first discussing the important topic of portability of programs between different machines. There is even a short BASIC program listing given to decompress a MICROTEXT program in order for this to be worked upon by a word processor. Appendix B gives a summary of all of the MICROTEXT commands and clearly labels the Commodore specific ones, another demonstration of the care and planning demonstrated by the manual's author, whilst Appendix C covers the system error messages.

MICROTEXT offers 4 modes of operation, command, edit, test and run. Command mode is used as the control phase for loading and saving modules, creating or deleting frames and entering the other modes. Edit mode allows editing of individual frames within a module whilst the test mode gives an interruptable run through the module and returns control back to command mode at the finish. Whilst run mode is self-explanatory and allows the module full control over the program. Note that additional commands may be entered into a frame from the test mode, a very useful facility. The modules can be saved to disk or cassette, and more than one drive unit is supported by MICROTEXT.

One of the strengths of MICROTEXT is the allowance of free-format input from the user which allows the module to branch depending on the response. The response can be measured easily using various permutations on time structures which enhance the basic appeal to programmers. One of the fundamental difficulties of writing computer aided learning (CAL) and computer based training (CBL) software is the age-old problem of stimulation for both the user and programmer. Striking a balance between going over the top and writing a module that defies explanation or portability and worst still confusing the using through inconsistent responses is very difficult but not insoluble.

Form filling seems about the best way to describe the interaction between user and machine where input is consistent in terms of response type. Because MICROTEXT allows a free-form approach to screen design, this poses another useful strength of the product in that questionaires may be quickly and effectively used to elicit a reply. Where a module is lengthy or complex, the use of variables is supported and provide further valuable additions to the pro-

grammes armoury. The variables used during the course of an individual module execution can be listed and examined in terms of value thus allowing checks to be made on response counts, analysis of repeated answers and prevention of repetitive responses.

This technique is developed further by MICROTEXT for what is termed summaries. These can be used to archive or report on user responses and the pattern that these responses took. The overall feeling is one of flexibility and MICROTEXT gave me the very strong impression that the programmer is control and not the machine, a feeling notably absent about the majority of languages I have used, with the exception of COMAL.

Error handling by MICROTEXT is very good, typing the word HELP in command mode supplies the author (programmer) with details of MICROTEXT syntax, whilst this facility can be incorporated and employed to good effect within modules to provide watertight error trapping. The run-time error can then be handled to provide assistance on the question, topic, module or MICROTEXT itself.

Access to the graphics facilities of the C64 are done through mode statements, similar to the graphic modes of BASIC 3.5 and BASIC 7.0 of the later Commodore machines. There is clear evidence that the writers of this version of MICROTEXT have made efforts to maintain portability of source code across the C64, BBC and APPLE machines but admit to limitations. Some commands actually do translate directly across, these include MOVE, DRAW, POINT and TRIANGLE, but obviously they were faced with an impossible task, particularly where the BBC was concerned with its larger range of screen resolutions. The situation changes radically where sprites and sound are concerned and the C64 become the awkward one, since the other two machines do not have anything approaching the capabilities of the C64 in these fields. However, in it's favour MICROTEXT does provide very good support of all of these features of the C64 and provided portability is not a priority of the module then there are no problems.

So why should anyone buy MICROTEXT? The same question could really be pointed at COMAL, in the sense that BASIC is the computers. BASIC was, and still is sold ostensibly on the basis of compatibility with other makes of home computers. Most readers of CCI will accept that compatibility of BASIC between machines is a poor joke. The situation is made more acute for C64 owners by the adoption of a very low standard of BASIC used by Commodore in version 2.0. To attempt to learn computer programming using this particular version of BASIC really does deserve a medal. Maybe this is the reason for the plethora of languages available to the C64. Thus the two requirements of BASIC, namely as a learning tool and as a means of portability of programs are not met by Commodore BASIC 2.0.

MICROTEXT is easier to learn than COMAL but has arguably even more potential in application software generation from a new user level. If I could start over again with my C64, I would forget BASIC 2.0 and start with MICROTEXT and then move on to COMAL.

The vast majority of C64's are not used for programming. BASIC 2.0 is one reason, the other being the fact that you have to fit in with the machine if you are using BASIC. MICROTEXT cannot fully overcome this problem of who runs what, the limitations of memory and 8-bit technology preclude this. On the other hand MICROTEXT is easier to use and because your programming will be more successful, the stimulus will be made to go further into computer programming. For those who are serious about coming to grips with computer programming, MICROTEXT is a vital addition to your library of languages.

Price: £45.00.

Contact: Ariadne Software Ltd. Tel: 01-960 0203.

64 EXPANSION GUIDE

A more accurate title would have been "C64 Peripheral Guide" since this book deals with the huge range of accessories and peripherals that this old warhorse has attracted. However, prospective buyers of this book should realise that the contents refer to the USA peripheral scene and consequently some of the items covered may not be available in this country or alternatively may not be appropriate. This last point particularly applies to such things as modems which use a different standard for operating frequencies. Indeed, British Telecom take great exception to anyone using a modem with BELL frequencies principally because the frequencies are close to those for internal switching within their network.

The book considers in-depth the types of peripherals and provides full details of the testing procedure. You see that this is not so much a book as a manual to purchasing equipment. Each product is given a rating in terms of price/performance, software compatability, ease of installation, documentation and finally vendor support. The category is rather subjective whereas the others do fulfill a genuine need. I particularly liked the section on vendor support. This topic should receive a great deal more attention than seems apparent these days. Machines and therefore their peripheral are becoming more complex (and more expensive in most cases!) and product support assumes an increasingly important role. This really comes back to where you buy from in the first place — a specialist retailer or a High Street "box-shifter".

I must admit that I found the range of peripherals available for the C64 to be positively staggering and there must be upward of 150 different products listed and evaluated here.

It includes a 'specialised peripherals" category that is a general "catch-all" and lists such items as numeric keypads, multiple expansion slot boards, etc. It includes some very esoteric devices which I have not even heard off before! One particular feature of this book which I felt was extremely good was the Glossary. It ran to 45 pages and not only was it accurate and succinct but directly relevant to the C64 — it is certainly the most comprehensive glossary I have seen to date and the author deserves a compliment for his efforts here. I liked this book for two reasons. The first that it fulfills a specific need, the second the consistency of the tests on each item described. This has the benefit for prospective purchasers to qualify different makes of peripherals. Only two minor criticism, the inclusion of prices and the fact that the text is out of date very soon after publishing. However, provided purchsers take this into account and use the prices only for comparison purposes then all will be well. I would feel that the publisher should consider releasing this book on an annual basis and extending the coverage to Europe — this would broaden the appeal and perform a very valuable function to the market.

Commodore 64 Expansion Guide
G. Phillips
Tab Books
£16.95

CENTRONICS PRINTER ON THE C128

The Commodore 128 is quite an improvement on the ageing 64 and even after all the extras, Commodore still have not fitted a centronics printer port.

The following material describes how to get by this problem, also the program listed below will work in 64 mode or on a C64 with a little modification.

A centronics port is an 8 bit parallel data port with a two line handshake. In simple English this means that the data to be transferred needs eight wires, and two wires are used for synchronising the communication between the computer and the printer. The STROBE line from the computer goes to 0 volts for a brief period to signal the printer that data is about to be transferred, and the printer will in turn put the ACKNOWLEDGE line low to signal the computer that it has received the data and is ready for more. We can implement this quite simply on the 128 as we have all the necessary lines available on the user port.

We could use pin 8 of the user port as STROBE line, the advantage being that very little work is needed to drive it. However some software does not make use of this particular pin so in some cases the cable would not work properly. The way round the problem is to use another line as STROBE and program it manually. For this purpose we have used pin M on the user port which is directly connected to the port A chip. All we now have to do is to create the pulses manually. If you have already built a cable using pin 8 and want to use this software, just desolder the wire on pin 8 and resolder it on pin M. Some commerical designs also use pin 8, and it may be well worth modifying them too. A last point: some printers do not like being connected on their logic 0 volt line, so instead link them on the chassis ground pin (pins 19 and 30 on the centronics plug are chassis ground).

The connections

User port	Centronics plug	
M	1	(Strobe)
C	2	(Data 0)
D	3	(Data 1)
E	4	(Data 2)
F	5	(Data 3)
H	6	(Data 4)
J	7	(Data 5)
K	8	(Data 6)
L	9	(Data 7)
B	10	(Acknowledge)
A or N	16 **or** 19 to 30	(ground . . . try which is best)

Connect the pins of the plugs in the way shown above. If you have the previous design or a commercial plug, check that the connections are the same. Changing the pin 8 to pin M will not harm the design, in fact it may make the plug more versatile.

The software

Here are two listings, an assembly source listing and a basic loader for both the 128 mode version and the 64 mode version. The first thing noticeable about the 128 assembly listing is the unusual memory location of the routine. The code resides in the RS 232 buffer, which is an area of memory common to all memory banks in the 128 mode. Having had the routine at another location would have involved more complex bank switching and selection, which would have made the code longer and harder to understand. Whatever memory configuration you are using, this area will always be instantly accessible. Note that if you open an RS 232 channel (device number 2) you will wipe the code.

The same routine can be used in 64 mode or on a C64 provided that the assembly address is changed to $C000 upwards. The first part of the program changes the CHOUT vector to point to our routine, and puts the old vectors in a jump address at the end of the program. Then we initialise the ports, setting port B as output on all lines and bit three of port A as output. We also put bit three high as the STROBE signal is a negative pulse (ie from 5 volts to 0 volts). Finally the external interrupt control is cleared. Then we have a small routine to print a message on the screen indicating that all is well.

Whenever the CHOUT routine is called the software checks which output device is currently being used. If it is device 4, the output is directed to the user port. You can customise this program to refer to the centronics port as device 5 by changing the $04 at line 1770 to a $05.

The data is put on port B and the strobe line is pulsed to indicate incoming data to the printer. We then check for the Acknowledge signal from the printer by reading the external interrupt register. Once the correct signal has been found, the routine gives control back to the normal operating system.

The whole program should assemble in about 130 bytes. Assemble it with either a C64 assembler, saving the code and reloading it in 128 mode with a BLOAD, typing it in straight with the 128 monitor, or use the basic loader below. A degree of customisation is possible but remember the memory limitations: the RS 232 buffer in 128 mode is only in the range $0C00 to $0D00.

Finally, one good reason why it would be worth upgrading from the original cable wiring: the software here will behave normally with commands such as OPEN1,4:CMD1.

E. Deghaye

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Program

C16 SIMON

'Simon' is a game that most of us have played in a hand-held electronic version. C. Whitfield has written us an addictive game based on the 'Simon' model for the C16. Unlike the old 'Simon' this game does not require the player to complete within a time limit. What a relief! It works in the same way — a sequence of sounds and colours are displayed and the player has to repeat them in the same sequence. In this case the function keys are used. When a mistake is made, the game is terminated and you must press any key to begin a new game and to update the high score — if you've achieved one!

```
10 DIM A%(50)
20 KEY1,"1":KEY2,"2":KEY3,"3":KEY8,"4"
30 GOSUB 700
40 COLOR4,4:COLOR0,4:SCNCLR
50 COLOR1,3,3:PRINT"    SIMON 16 FOR THE C16 AND PLUS/4"
60 COLOR1,7,3:PRINT"                BY C.WHITFIELD"
70 COLOR1,13,4:PRINT"■■■
```

```
430 GET B$
440 NEXT
450 GOTO 260
460 PRINT"■■■
```

Program

TURBO 64

This is a very useful Turbo program from Richard Franklin, an acknowledged expert in Commodore programming. It will load many different types of programs at a greatly increased speed. It has also the advantage over some turbos that it does not require you to load in a program prior to turbo loading a program. When you load from basic or from the monitor it will always return back to 'ready'. Chain loading was considered but was thought to be too complicated.

```
10 REM ********************************
20 REM *  TURBO TAPE ROUTINE FOR THE  *
30 REM *          COMMODORE 64.       *
40 REM *-----------------------------*
50 REM * WRITTEN BY RICHARD FRANKLIN  *
60 REM * FOR COMMODORE COMPUTING INT. *
70 REM *-----------------------------*
80 REM *  SAVE IN TURBO FORMAT:       *
90 REM *                             *
100 REM*       SAVE"FILENAME",7      *
110 REM*                             *
120 REM********************************
130 REM
140 I=49152:ER=0:PRINT CHR$(147)" PLEASE WAIT, READING DATA INTO MEMORY"
150 FOR X=0 TO 40:T=0:FOR Y=0 TO 14
160 READ A:POKE I,A:I=I+1:T=T+A:NEXT
170 READ A:T=T-(INT(T/256)*256)
180 IF T<>A THEN PRINT"DATA ERROR IN LINE"1000+(X*10)"CHECKSUM <>"A:STOP
190 PRINT 1000+(X*10)"OK":NEXT
200 PRINT CHR$(17)"O.K.":SYS 49152:NEW
1000 DATA 169,011,141,050,003,169,192,141,051,003,096,165,186,201,007,  049
1010 DATA 240,003,076,237,245,165,174,141,103,193,165,175,141,104,193,  051
1020 DATA 165,193,141,101,193,165,194,141,102,193,165,185,141,105,193,  073
1030 DATA 169,001,170,168,032,186,255,032,208,247,144,054,032,056,248,  210
1040 DATA 176,048,032,143,246,162,192,160,002,134,193,132,194,162,252,  180
1050 DATA 160,003,134,174,132,175,169,003,032,106,247,176,022,162,042,  201
1060 DATA 160,193,134,193,132,194,162,102,160,194,134,174,132,175,024,  215
1070 DATA 032,122,246,144,004,096,076,019,247,173,032,208,072,173,101,  209
1080 DATA 193,133,172,173,102,193,133,173,173,103,193,133,174,173,104,  021
1090 DATA 193,133,175,160,000,032,191,192,140,102,194,032,209,252,176,  133
1100 DATA 010,177,172,032,237,192,032,219,252,208,241,173,102,194,032,  225
1110 DATA 237,192,032,003,193,165,001,009,032,133,001,173,017,208,009,  125
1120 DATA 016,141,017,208,104,141,032,208,088,024,096,165,001,041,031,  033
1130 DATA 133,001,173,017,208,041,239,141,017,208,202,208,253,136,208,  137
1140 DATA 250,120,169,160,141,004,221,169,000,141,005,221,169,025,141,  144
1150 DATA 014,221,169,001,032,237,192,136,208,248,169,067,133,189,077,  045
1160 DATA 102,194,141,102,194,169,008,133,165,038,189,032,003,193,198,  069
1170 DATA 165,208,247,096,162,112,144,002,162,252,142,004,221,169,000,  038
1180 DATA 141,005,221,032,023,193,238,032,208,169,001,044,013,221,240,  245
1190 DATA 251,165,001,073,008,133,001,169,025,141,014,221,096,173,255,  190
1200 DATA 002,240,013,173,251,002,133,172,173,252,002,133,173,076,222,  225
1210 DATA 002,165,185,208,239,165,043,133,172,165,044,133,173,173,253,  205
1220 DATA 002,056,237,251,002,170,173,254,002,237,252,002,168,024,138,  176
1230 DATA 101,172,133,174,152,101,173,133,175,076,154,003,000,000,000,  011
1240 DATA 000,000,192,002,192,002,192,002,192,002,192,002,192,002,000,  140
1250 DATA 000,000,000,076,072,178,000,044,249,192,002,193,254,192,002,  174
1260 DATA 192,002,192,002,192,002,192,002,192,002,192,002,237,246,192,  047
1270 DATA 002,192,002,192,002,192,002,192,002,072,152,072,173,005,220,  192
1280 DATA 160,025,140,014,220,238,032,208,073,002,074,074,038,169,165,  096
1290 DATA 169,144,002,176,013,201,001,208,009,169,022,141,075,003,169,  222
1300 DATA 254,133,169,173,013,220,104,168,104,064,201,001,240,241,201,  238
1310 DATA 067,240,004,169,002,208,230,169,000,133,165,169,042,208,222,  236
1320 DATA 160,000,145,172,069,165,133,165,230,172,208,002,230,173,165,  141
1330 DATA 172,197,174,165,173,229,175,144,201,169,070,208,194,133,194,  038
1340 DATA 169,002,133,002,208,186,120,169,005,133,001,169,031,141,013,  202
1350 DATA 221,141,013,220,173,013,221,173,013,220,169,052,141,254,255,  231
1360 DATA 169,097,141,250,255,169,003,141,255,255,141,251,255,169,104,  095
1370 DATA 141,004,220,169,003,141,005,220,169,144,141,013,220,169,000,  223
1380 DATA 133,002,088,165,002,240,252,169,055,133,001,173,000,221,072,  170
1390 DATA 032,163,253,104,141,000,221,032,021,253,032,083,228,165,194,  130
1400 DATA 197,165,208,007,166,174,164,175,076,167,225,076,156,225,000,  133

READY.
```

```
1000 033C          !*********************************
1010 033C          !*   TURBO TAPE ROUTINE FOR THE  *
1020 033C          !*          COMMODORE 64.        *
1030 033C          !*-------------------------------*
1040 033C          !*  WRITTEN BY RICHARD FRANKLIN  *
1050 033C          !*  FOR COMMODORE COMPUTING INT. *
1060 033C          !*-------------------------------*
1070 033C          !*   INITIALISE BY SYS(49152).   *
1080 033C          !*   SAVE IN TURBO FORMAT:       *
1090 033C          !*                               *
1100 033C          !*       SAVE "FILENAME",7       *
1110 033C          !*                               *
1120 033C          !*********************************
1130 033C          !
1140 033C          ADRLOD       =  $02C0
1150 033C          ADREND       =  $03FC
1160 033C          !
1170 C000          *=$C000
1180 C000          !
1190 C000 A90B               LDA #<SAVE          !SET SAVE VECTOR
1200 C002 8D3203             STA $0332           ! TO POINT TO TURBO
1210 C005 A9C0               LDA #>SAVE          ! TAPE CODE
1220 C007 8D3303             STA $0333,
1230 C00A 60                 RTS
1240 C00B          !
1250 C00B A5BA     SAVE      LDA $BA
1260 C00D C907               CMP #7              !DEVICE 7
1270 C00F F003               BEQ SAVE00          ! YES, DO TURBO
1280 C011 4CEDF5             JMP $F5ED           ! DO NORMAL SAVE
1290 C014          !
1300 C014 A5AE     SAVE00    LDA $AE             !SAVE ADDRESS
1310 C016 8D67C1             STA FEND            ! OF PROGRAM
1320 C019 A5AF               LDA $AF
1330 C01B 8D68C1             STA FEND+1
1340 C01E A5C1               LDA $C1
1350 C020 8D65C1             STA FSTART
1360 C023 A5C2               LDA $C2
1370 C025 8D66C1             STA FSTART+1
1371 C028 A5B9               LDA $B9             !SAVE FILETYPE
1372 C02A 8D69C1             STA FLTYPE
1380 C02D A901               LDA #1
1390 C02F AA                 TAX
1400 C030 A8                 TAY
1410 C031 20BAFF             JSR $FFBA
1420 C034 20D0F7             JSR $F7D0           !TEST BUFFER ALLOC
1430 C037 9036               BCC SAVE04          ! BAD
1440 C039 2038F8             JSR $F838           !TEST TAPE SWITCH
1450 C03C B030               BCS SAVE03          ! STOP
1460 C03E 208FF6             JSR $F68F           !'SAVING'
1470 C041 A2C0               LDX #<ADRLOD        !SET ADDRESS TO
1480 C043 A002               LDY #>ADRLOD        ! PUT IN HEADER
1490 C045 86C1               STX $C1
1500 C047 84C2               STY $C2
1510 C049 A2FC               LDX #<ADREND
1520 C04B A003               LDY #>ADREND
1530 C04D 86AE               STX $AE
1540 C04F 84AF               STY $AF
1570 C051 A903               LDA #3
1580 C053 206AF7             JSR $F76A           !SAVE HEADER
1590 C056 B016               BCS SAVE03          !STOP KEY
1600 C058 A22A               LDX #<LOADST        !SET ADDRESS TO
1610 C05A A0C1               LDY #>LOADST        ! SAVE (LOADER)
1620 C05C 86C1               STX $C1
1630 C05E 84C2               STY $C2
1640 C060 A266               LDX #<LODEND
1650 C062 A0C2               LDY #>LODEND
1660 C064 86AE               STX $AE
1670 C066 84AF               STY $AF
```

```
1680 C068 18                CLC
1690 C069 207AF6            JSR $F67A       !SAVE LOADER
1700 C06C 9004              BCC SAVE05      !O.K.
1710 C06E           !
1720 C06E 60        SAVE03  RTS             !STOP ERROR
1730 C06F           !
1740 C06F 4C13F7    SAVE04  JMP $F713       !DEVICE NOT PRESENT
1750 C072           !
1760 C072 AD20D0    SAVE05  LDA $D020       !SAVE BORDER COL.
1770 C075 48                PHA
1780 C076 AD65C1            LDA FSTART      !SET UP POINTERS
1790 C079 85AC              STA $AC         ! FOR TURBO SAVE
1800 C07B AD66C1            LDA FSTART+1
1810 C07E 85AD              STA $AD
1820 C080 AD67C1            LDA FEND
1830 C083 85AE              STA $AE
1840 C085 AD68C1            LDA FEND+1
1850 C088 85AF              STA $AF
1860 C08A A000              LDY #0
1870 C08C 20BFC0            JSR WRTHDR      !WRITE TURBO HEADER
1880 C08F 8C66C2            STY CHECK
1890 C092 20D1FC    SAVE06  JSR $FCD1       !TEST FOR END
1900 C095 B00A              BCS SAVE07      !REACHED END
1910 C097 B1AC              LDA ($AC),Y
1960 C099 20EDC0            JSR WRTBYT
1970 C09C 20DBFC            JSR $FCDB       !BUMP POINTERS
1980 C09F D0F1              BNE SAVE06      !ALWAYS
1990 C0A1           !
2000 C0A1 AD66C2    SAVE07  LDA CHECK       !WRITE CHECKSUM
2010 C0A4 20EDC0            JSR WRTBYT
2020 C0A7 2003C1            JSR WRTBIT      !CLOSE OFF LAST BIT
2030 C0AA A501              LDA $01         !STOP TAPE
2040 C0AC 0920              ORA #$20
2050 C0AE 8501              STA $01
2060 C0B0 AD11D0            LDA $D011       !RESTORE SCREEN
2070 C0B3 0910              ORA #$10
2080 C0B5 8D11D0            STA $D011
2090 C0B8 68                PLA             !RESTORE BORDER COL.
2100 C0B9 8D20D0            STA $D020
2110 C0BC 58                CLI
2120 C0BD 18                CLC             !GOOD EXIT
2130 C0BE 60                RTS
2140 C0BF           !
2150 C0BF A501      WRTHDR  LDA $01         !START UP TAPE
2160 C0C1 291F              AND #$1F
2170 C0C3 8501              STA $01
2180 C0C5 AD11D0            LDA $D011       !BLANK SCREEN
2190 C0C8 29EF              AND #$EF
2200 C0CA 8D11D0            STA $D011
2230 C0CD CA        WRTHD1  DEX             !PAUSE FOR TAPE
2240 C0CE D0FD              BNE WRTHD1      ! TO REACH FULL
2250 C0D0 88                DEY             ! SPEED
2260 C0D1 D0FA              BNE WRTHD1
2270 C0D3 78                SEI             !STOP IRQ
2280 C0D4 A9A0              LDA #$A0        !SET INITIAL TIMER
2290 C0D6 8D04DD            STA $DD04
2300 C0D9 A900              LDA #$00
2310 C0DB 8D05DD            STA $DD05
2320 C0DE A919              LDA #$19        !START TIMER
2330 C0E0 8D0EDD            STA $DD0E
2350 C0E3 A901      WRTHD2  LDA #$01        !ALLIGN CHAR.
2360 C0E5 20EDC0            JSR WRTBYT
2370 C0E8 88                DEY
2380 C0E9 D0F8              BNE WRTHD2      !A FEW TIMES
2390 C0EB A943              LDA #$43        !WRITE SYNC
2400 C0ED           !
2410 C0ED 85BD      WRTBYT  STA $BD         !SAVE OUTPUT BYTE
```

```
2411 C0EF 4D66C2            EOR CHECK          !CALCULATE CHECKSUM
2412 C0F2 8D66C2            STA CHECK
2420 C0F5 A908              LDA #8
2430 C0F7 85A5              STA $A5            !SETUP COUNT
2440 C0F9 26BD   WRTBY1     ROL $BD
2450 C0FB 2003C1            JSR WRTBIT         !BIT IN CARRY
2460 C0FE C6A5              DEC $A5
2470 C100 D0F7              BNE WRTBY1
2480 C102 60                RTS
2490 C103        !
2500 C103 A270   WRTBIT     LDX #$70           !ASSUME '0'
2510 C105 9002              BCC WRTBI1         !CORRECT
2520 C107 A2FC              LDX #$FC           !SET LONG '1'
2530 C109 8E04DD WRTBI1     STX $DD04
2540 C10C A900              LDA #0
2550 C10E 8D05DD            STA $DD05
2560 C111 2017C1            JSR WRTBI2
2570 C114 EE20D0            INC $D020
2580 C117        !
2590 C117 A901   WRTBI2     LDA #1
2600 C119 2C0DDD WRTBI3     BIT $DD0D          !TEST FOR TIMER
2610 C11C F0FB              BEQ WRTBI3
2620 C11E A501              LDA $01            !TOGGLE OUTPUT PULSE
2630 C120 4908              EOR #8
2640 C122 8501              STA $01
2650 C124 A919              LDA #$19           !RE-START TIMER
2660 C126 8D0EDD            STA $DD0E
2670 C129 60                RTS
2680 C12A        !
2690 C12A ADFF02 LOADST     LDA $02FF          !FIXED LOAD
2700 C12D F00D              BEQ LOAD01         !NO
2710 C12F ADFB02 LOAD00     LDA $02FB          !SET LOAD ADDRESS
2720 C132 85AC              STA $AC            ! SAVED
2730 C134 ADFC02            LDA $02FC
2740 C137 85AD              STA $AD
2750 C139 4CDE02            JMP $02DE          !(LOAD02)
2760 C13C A5B9   LOAD01     LDA $B9            !MONITOR LOAD
2770 C13E D0EF              BNE LOAD00         !YES
2780 C140 A52B              LDA $2B            !SET LOAD ADDRESS
2790 C142 85AC              STA $AC            ! TO START OF BASIC
2800 C144 A52C              LDA $2C
2810 C146 85AD              STA $AD
2820 C148 ADFD02 LOAD02     LDA $02FD          !CALC. LENGTH IN
2830 C14B 38                SEC                ! .X, .Y AND ADD TO
2840 C14C EDFB02            SBC $02FB          ! START ADDRESS TO
2850 C14F AA                TAX                ! GIVE END ADDRESS
2860 C150 ADFE02            LDA $02FE
2870 C153 EDFC02            SBC $02FC
2880 C156 A8                TAY
2890 C157 18                CLC
2900 C158 8A                TXA
2910 C159 65AC              ADC $AC
2920 C15B 85AE              STA $AE
2930 C15D 98                TYA
2940 C15E 65AD              ADC $AD
2950 C160 85AF              STA $AF
2960 C162 4C9A03            JMP $039A
2970 C165        !
2980 C165 0000   FSTART     WOR 0              !$02FB/C
2990 C167 0000   FEND       WOR 0              !$02FD/E
3000 C169 00     FLTYPE     BYT 0              !$02FF
```

```
3010 C16A          !
3020 C16A          !AUTO-RUN ON ANYTHING
3030 C16A          !
3040 C16A C002C0             WOR $02C0,$02C0,$02C0,$02C0
3050 C172 C002C0             WOR $02C0,$02C0,0,0
3060 C17A 4C48B2             JMP $B248
3070 C17D 00                 BYT 0
3080 C17E 2CF9C0             WOR $F92C,$02C0,$FEC1,$02C0
3090 C186 C002C0             WOR $02C0,$02C0,$02C0,$02C0
3100 C18E C002C0             WOR $02C0,$02C0,$F6ED,$02C0
3110 C196 C002C0             WOR $02C0,$02C0,$02C0,$02C0
3120 C19E          !
3130 C19E          !*=0334 (MAIN LOADER)
3140 C19E          !
3150 C19E 48                 PHA
3160 C19F 98                 TYA
3170 C1A0 48                 PHA
3180 C1A1 AD05DC             LDA $DC05              !GET TIMER HI
3190 C1A4 A019               LDY #$19               !RE-START TIMER
3200 C1A6 8C0EDC             STY $DC0E
3205 C1A9 EE20D0             INC $D020              !FLICK BORDER
3210 C1AC 4902               EOR #2
3220 C1AE 4A                 LSR A
3230 C1AF 4A                 LSR A                  !BIT INTO CARRY
3240 C1B0 26A9               ROL $A9
3250 C1B2 A5A9               LDA $A9
3251 C1B4          !
3252 C1B4          !*=$034A
3253 C1B4          !
3260 C1B4 9002               BCC BITGOT             !BYTE READ
3270 C1B6 B00D               BCS EXIT
3280 C1B8 C901     BITGOT    CMP #1                 !ALLIGN
3290 C1BA D009               BNE EXIT
3300 C1BC A916               LDA #$16               !SET 'BCC' TO NEXT
3310 C1BE 8D4B03   EX0       STA $034B
3320 C1C1 A9FE     EX1       LDA #$FE               !GET READY FOR
3330 C1C3 85A9               STA $A9                ! NEXT BYTE
3340 C1C5 AD0DDC   EXIT      LDA $DC0D              !CLEAR IRQ
3350 C1C8 68                 PLA
3360 C1C9 A8                 TAY
3370 C1CA 68                 PLA
3380 C1CB 40                 RTI
3390 C1CC          !
3400 C1CC C901               CMP #1                 !ALLIGN
3410 C1CE F0F1               BEQ EX1
3420 C1D0 C943               CMP #$43               !SYNC
3430 C1D2 F004               BEQ RDBYT0
3440 C1D4 A902               LDA #2                 !NO, ALLIGN AGAIN
3450 C1D6 D0E6               BNE EX0
3460 C1D8 A900     RDBYT0    LDA #0                 !ZERO CHECK
3470 C1DA 85A5               STA $A5
3480 C1DC A92A               LDA #$2A               !SET 'BCC' TO NEXT
3490 C1DE D0DE               BNE EX0
3500 C1E0          !
3510 C1E0 A000               LDY #0
3520 C1E2 91AC               STA ($AC),Y            !STORE BYTE
3530 C1E4 45A5               EOR $A5                !CALCULATE CHECKSUM
3540 C1E6 85A5               STA $A5
3550 C1E8 E6AC               INC $AC                !INCREMENT STORE
3560 C1EA D002               BNE RDBYT1             ! POINTER
3570 C1EC E6AD               INC $AD
3580 C1EE A5AC     RDBYT1    LDA $AC                !TEST FOR END
3590 C1F0 C5AE               CMP $AE
3600 C1F2 A5AD               LDA $AD
3610 C1F4 E5AF               SBC $AF
3620 C1F6 90C9               BCC EX1
```

```
3630 C1F8 A946                  LDA #$46        !SET 'BCC' TO NEXT
3640 C1FA D0C2                  BNE EX0
3645 C1FC               !
3650 C1FC 85C2                  STA $C2         !SAVE CHECKSUM
3660 C1FE A902                  LDA #2          !FLAG END
3670 C200 8502                  STA $2
3680 C202 D0BA                  BNE EX0
3690 C204               !
3700 C204               !*=$039A
3710 C204               !
3720 C204 78                    SEI
3730 C205 A905                  LDA #$05        !MOTOR ON AND KERNAL
3740 C207 8501                  STA $01         ! OUT
3760 C209 A91F                  LDA #$1F        !KILL ALL IRQ/NMI
3770 C20B 8D0DDD                STA $DD0D
3780 C20E 8D0DDC                STA $DC0D
3790 C211 AD0DDD                LDA $DD0D
3800 C214 AD0DDC                LDA $DC0D
3810 C217 A934                  LDA #$34        !SET IRQ AND NMI
3820 C219 8DFEFF                STA $FFFE       ! VECTORS
3830 C21C A961                  LDA #$61
3840 C21E 8DFAFF                STA $FFFA
3850 C221 A903                  LDA #3
3860 C223 8DFFFF                STA $FFFF
3870 C226 8DFBFF                STA $FFFB
3880 C229 A968                  LDA #$68        !SET TIMER
3890 C22B 8D04DC                STA $DC04
3900 C22E A903                  LDA #3
3910 C230 8D05DC                STA $DC05
3920 C233 A990                  LDA #$90        !ENABLE TAPE IRQ
3930 C235 8D0DDC                STA $DC0D
3940 C238 A900                  LDA #0          !CLEAR EOF FLAG
3950 C23A 8502                  STA $02
3960 C23C 58                    CLI
3970 C23D               !
3980 C23D A502          LDWAIT  LDA $02         !WAIT UNTIL END
3990 C23F F0FC                  BEQ LDWAIT      ! OF LOAD
4000 C241 A937                  LDA #$37        !MOTOR OFF/KERNAL
4010 C243 8501                  STA $01         ! AND BASIC IN
4030 C245 AD00DD                LDA $DD00       !SAVE BANK SELECT
4040 C248 48                    PHA
4050 C249 20A3FD                JSR $FDA3       !RESET I/O
4060 C24C 68                    PLA
4070 C24D 8D00DD                STA $DD00
4080 C250 2015FD                JSR $FD15       !RESET KERNAL VECTORS
4090 C253 2053E4                JSR $E453       !RESET BASIC VECTORS
4100 C256 A5C2                  LDA $C2
4110 C258 C5A5                  CMP $A5
4120 C25A D007                  BNE LDERR       !CHECKSUM ERROR
4130 C25C A6AE                  LDX $AE
4140 C25E A4AF                  LDY $AF
4150 C260 4CA7E1                JMP $E1A7
4160 C263               !
4170 C263 4C9CE1        LDERR   JMP $E19C
4180 C266               !
4190 C266               LODEND   !$03FC
4200 C266               !
4210 C266 00            CHECK   BYT 0
```

BASIC for beginners

PART VII

In the last part of the series I said that we would be looking at FUNCTIONS and what they mean in BASIC. A FUNCTION is a mathematical relationship between two variables. Remember earlier in this series where we looked at variables and what these meant — a number is assigned to a letter:

```
X = 10
Y = – 6
A = 3
B = 144
```

All of these letters represent variables — in the case of X the value assigned is 10. Commodore BASIC allows you to define different types of variables, these can range from numeric variables such as those listed above to string variables which are denoted by the addition of the dollar ($) sign AFTER the variable i.e. X$ or B$.

The use of some functions is limited to numeric variables, note the use of the term 'mathematical relationship'. If you run the following program, watch what happens:-

```
10 A$ = "BILL IS"
20 B$ = "RICH"
30 PRINT A$:"PRINT B$"
40 A$ = B$
50 PRINT A$:PRINT B$
```

Now try changing around line 40 to make B$ = A$. Notice how the output is different because we have changed the ASSIGNMENT of the string variables. It is important to differentiate between ASSIGNMENTS and VALUES. A function must be numeric and it describes that for ONE VALUE of X the value of Y WILL BE whatever. The form of a function looks like this:-

```
X = FUNCTION (Y)
```

X takes the function value and is known as a 'dependent variable' whilst Y is termed the 'independent variable' or 'argument'. When you move on to study and learn other languages such as COMAL, PASCAL or C you will find that 'arguments' form a very important part of these languages.

If you look in your "USER GUIDE" for your machine you should see a list of FUNCTIONS that you can use. A lot of them do not mean very much and are rarely used. For example, the LOG and EXP functions are purely mathematical and would only be used as some part of a complex equation. Others such as SIN, COS and sometimes TAN are used a lot in graphics programming, usually for the definition of circles or patterns. However, to use these effectively you have to know more than a little about the principles of trigonometry. Others are quite straightforward in use, for example:-

```
10 X = 9
20 Y = SQR (X)
30 PRINT Y
```

This would give us an answer of 3 since the function SQR means 'square root'. Similarly, the functions ABS and INT provide the following:-

```
10 A = 23.9999 : B= 24.9999
20 C = INT(A) : D= INT(B)
30 PRINT C : PRINT D
```

When you run the above program you should see the values 23 and 24 appear on the screen. It really would have made more sense if the values had been 24 and 25 because both numbers are closer to these values than the printed output. This is called 'rounding' — the machine does not take into account the numeric values beyond the decimal point. Some versions of BASIC allow you to 'round up'; Commodore BASIC only allows the rounding down of numbers when using the INT function — a point worth noting if you are doing accurate maths programming. The function to overcome this problem partially is the ABS function meaning the ABSolute value of a number — i.e. no rounding up OR down.

Using ABS in place of INT in the above program would produce the output of 23.9999 and 24.9999 respectively. But let's move away from these predefined functions to those which you can define yourself. User-defined functions are a very powerful tool for programming in BASIC. They overcome the limitations of the standard or set functions and allow the programmer to create customised functions for their own applications. The facility in Commodore BASIC is called DEF FN.

DEF FN (meaning DEFined FunctioN) sets up a numeric function with one 'dependent' variable called or used by the 'independent' variable FN. For example suppose we had a mathematical formula such as:-

```
(X + 233)/(X – 273) + 14X – 44
```

We could place this into a defined function rather than keep entering the equation in each time we called it. It would look like this in our program:-

```
100 X = 14
110 DEF FN Y (X) = (X + 233)/(X – 273)

120 PRINT FN Y (X)
130 PRINT FN Y (X) + 3
140 PRINT FN Y (X) / 12
150 X = 13.....and so on
```

Alternatively:-

```
110 DEF FN Y (X) = (X + 233)/(X – 273)
    + 14X – 44
120 PRINT FN Y (13)
130 PRINT FN Y (12) + 3
140 PRINT FN Y (11) / 12
```

Notice how we have changed the argument from 14 to 13, you can combine this program with a loop structure such as those discussed earlier in the series to keep changing the argument and outputting the new value. DEF FN is grossly underused by most programmers and yet not only does it make a program more intelligable but also save memory as well. Remember the golden rule of BASIC programming "if it is short — it is fast". You can also use this facility to define new BASIC words in your programming.

For example, suppose you wanted to PEEK two consecutive addresses in

memory to examine their values. Using DEF FN a possible technique would look like this:-

```
10 MEM = 0
20 DEF FN DEEK (X) = PEEK (X) + 256
   * PEEK (X + 1)
30 PRINT FN DEEK (MEM)
40 MEM = MEM + 2
50 GOTO 20
```

Let's just walk through this program and see what it does. Line 10 zero's the variable MEM (meaning memory) whilst the function DEEK is defined in line 20. The program output appears from line 30 with line 40 serving as a simple increment of the variable MEM. Why are we incrementing by a value of 2? The answer lies in the function itself — we are looking at TWO locations in memory. Assume the program has just started — the value of DEEK will be 0 and 1 (note the increment in the last bracket i.e. 'PEEK (X+1)'). If we incremented the variable MEM by 1, then the value that DEEK would return would be the contents of memory locations 1 and 2. But we have just read location 1 on the first cycle or iteration of the program — thus the increment value is insufficient.

	Increment MEM by 1	Increment MEM by 2
Memory being read	0 and 1	0 and 1
1st iteration of MEM	1 and 2	2 and 3
2nd iteration of MEM	2 and 3	4 and 5
3rd iteration of MEM	3 and 4	6 and 7

This particular function DEEK was chosen with some care as an example since it offers a lot of possibilities to the creative programmer. For instance it could form the basis of a simple monitor, a utility that allows you to examine and modify the contents of your machine's memory directly from the keyboard. If you used the POS and SPC functions then the screen output could by tidied-up rather than scrolling off the bottom of the display. Look back at some of the previous articles in this series for ideas on how to do this — it really isn't that difficult.

I'm now going to move on to a new topic, namely LOGICAL OPERATIONS. No it is nothing to do with hospitals but a technique of distinguishing between logical and numeric values. So far we have looked at numeric and character string values, but there is a third type of operator available in Commodore BASIC — logic.

Anything that appears on the screen or is typed in by you is represented inside your machine by numbers. Although you may be typing in decimal numbers, the machine is actually converting these into binary numbers. A binary number is made up of just 1 and 0 which represents the electrical switching operation of ON and OFF. If we replaced this ON/OFF with a TRUE or FALSE indicator thenwe can use this as a basis for an operation. For instance, if we said that FALSE was equal to / and TRUE was equal to −1 then we could use this to distinguish between expressions of variables.

Before we take this any further let's have a look at binary numbers. I have laid out the table below which runs from 0 to 10 with the binary equivalents:-

0	0000
1	0001
2	0010
3	0011
4	0100
5	0101
6	0110
7	0111
8	1000
9	1001
10	1010

You will see that the sequence is quite easy to follow — it goes from 0, 1, 10 and 11 before there is a shift to the left, really the only thing you need to learn as far as binary numbers is concerned is this simple sequence.

If we had two variables A and B and we placed in a TRUTH TABLE, a list of all the possible combinations of two variable values in terms of TRUE or FALSE (don't worry you'll see what this is further on) we could have a structure like this:-

IF A	B	THEN A AND B
TRUE	TRUE	TRUE
TRUE	FALSE	FALSE
FALSE	TRUE	FALSE
FALSE	FALSE	FALSE

In other words if both A and B have the same value then the outcome is TRUE: if they don't the outcome is FALSE. Let's try this in a program and see:-

```
10 IF A = 5 AND B = 5 THEN 40
20 PRINT "THIS IS TRUE"
30 STOP
40 THEN PRINT "THIS IS FALSE"
```

```
10 IF A = 5 AND B = 6 THEN 40
20 PRINT "THIS IS FALSE"
30 STOP
40 PRINT "THIS IS TRUE"
```

The programs are self-explanatory when compared to the Truth Table and illustrate the principle of TRUE and FALSE expressions. If the expression is true then the program drops through and executes the line following. If the expression is false it will be directed by the THEN statement. Now try this program to and observe the result:-

```
10 PRINT 5 AND 6
```

Why didn't we get the value of 11? If you convert 5 and 6 to binary numbers you will have this:-

5 = 0101
6 = 0110

Now take the Truth Table and change the values from:-

A	B	A AND B
TRUE	TRUE	TRUE
TRUE	FALSE	FALSE
FALSE	TRUE	FALSE
FALSE	FALSE	FALSE

to:-

A	B	A AND B	
1	1	1	line a
1	0	0	line b
0	1	0	line c
0	0	0	line d

So, when 5 AND 6 are added together in binary fashion:-

5 = 0101
6 = 0110

0.....see line d
1.....see line a
0.....see lines b or c
0.....see lines b or c

If you look back to the table of binary numbers you will see that 0100 represents the value 4 which is what appeared on your screen. What we are doing here is to operate directly on the numbers themselves and not the variables since no variables have been assigned to the numbers. This particular operation is known as ANDING and used mainly in machine code work although it does have applications in a high-level language such as BASIC.

There are two other logical operators used in Commodore BASIC. These are OR and NOT and in the next part of this series I will be looking at these and seeing how they work. Study this part of the series carefully. It is vital that you grasp the elements of logical operation if you want to progress to machine code. The principle difficulty is learning the Truth Tables. I have listed below the Truth Tables for the OR and NOT operators.

A	B	A OR B
TRUE	TRUE	TRUE
TRUE	FALSE	TRUE
FALSE	TRUE	TRUE
FALSE	FALSE	FALSE

A	B	A NOT B
TRUE	TRUE	FALSE
TRUE	FALSE	TRUE
FALSE	TRUE	TRUE
FALSE	FALSE	FALSE

Dear Rae...

This month your letters are answered by Rae West. Rae is the author of three large reference books on Commodore computers; the latest is Programming the Commodore 64, following Programming the VIC and Programming the PET/CBM. All are published in the UK by Level Ltd. Rae is also published in the USA by Compute! Books.

Dear Rae,

I am taking a BTEC NATIONAL DIPLOMA IN COMPUTER STUDIES, and I am stuck for a MAT function on my home Micro, a Commodore 64. Is there anyone out in computer land who can help me with a machine code program that will do MATRICES on the Commodore 64.

I realise this might be too tall an order but I hope out in computer land there is someone clever enough to help me out, I need the MAT function for the Quantitative Methods section of the course.

If someone can help me, they could send their solution to me at my address, and I will gladly refund their postage.

Keep up the good work in a great magazine.

Thanks once again!

James R. Strang
165 Ashton Hill Lane, Droylsden, Manchester M35 6FH.

Over to you, readers!

Dear Rae,

I am a very keen radio amateur and have just recently purchased a new Commodore +4 computer. My intention was to communicate world wide by high speed morse etc. so I bought a Multicom Data Interface for de-coding R.T.T.Y. So far I have been unable to find anyone who is producing a program for the +4. There is a good program for the Commodore 64. Can you please help.

J. D. Hogarth
Kelso.

There are quite a few good programs for the 64 but none we can find for the Plus 4 — yet... But we think we've found a source for you and other radio-keen readers (see 'All in the Air' in this issue). We should be able to print one in a near future issue.

Dear Rae,

Some Plus/4 queries:

(1) I am having extreme difficulty in accessing RAM under ROM at $8000 (Hex 8000). How can I read the RAM? Help!

(2) I've written an invaluable, properly-structured BASIC program, a sound and music utility. Would you consider my program for publication without a printout? The program description is vague to protect my interests!

(3) After the high Xmas sales of the C16/Plus4, surely these excellent machines are worth more than a couple of pages in CCI!

C. K. Haigh, Sheffield

(1) As with the 64, it's impossible to switch out BASIC ROM without causing BASIC to disappear unless you copy BASIC into RAM using a loop including POKE X, PEEK(X).

The RAM is usuable for video information (if the TED chip is programmed to read it) and for machine-language routines. These can be accessed from BASIC by a SYS call to a routine in RAM like this: LDA FF/STA FF3F/JMP 8000 which first selects RAM, then jumps to the machine-language poked behind BASIC ROM. The routine must end with LDA FF/STA FF3E/RTS to get back to BASIC.

(2) Why not check over the phone? CCI's requirements change over time, and with specific issues; I'd suspect a program on disk would be better than a printout, since it can be tested more easily.

(3) This is partly an editorial decision, and partly a matter of contributions from outside. I'm sure CCI's aim is to be as saleable as possible.

Some Queries on Disk Drives:—

Dear Rae,

Which disk drive can you use with the Plus/4? The Commodore manual says 'models 1541 and 1542'. However, their photograph shows a 1551. And a book by Sarah Mayer says 'only the 1541 works'.

Yours faithfully,

N. Greenwood, Bolton

Yes. Unfortunately you are a victim of outdated information. Commodore made a limited number of 1551 drives in response to a special order by Laskys. These only work with the Plus/4 and C16 and are designed to be fast. The 1541 fits its serial bus, and operates with the 64 (and VIC20) too; it isn't particularly fast. The 1542 is a model which was anounced but never appeared.

So, most Plus/4 users who have disk drives use 1541s.

Dear Rae,

I have a 1551 which plugs into the Plus/4 memory expansion slot. Is it possible to use the same disk drive with a Commodore 64?

D. B. Cross, Rochdale

To do this, you'd need a device to connect the 64's serial port to the edge connector of your 1551 disk drive. You'd also need software to duplicate the effect of the Plus/4's inhibit routines which handle the parallel interface. This could be wedged into 64 BASIC — but wouldn't be 100% reliable, because it might get overwritten. Presumably an interface could be designed, containing ROM, but I doubt whether anyone has done this because of the low overall demand.

Dear Rae,

Many 128 owners have 1571 drives (these are double-sided—RW). Many will possess a number of single-sided disks. Is it practicable to format a single-sided disk for 1571 use and thus double the storage space?

Yours sincerely,

P. McDonald, Worsley

If the HEADER command (equivalent to NEW on 64 disks) works, the disk is probably OK: if it won't format a disk, that disk is obviously suspect. Some disk programs have test routines — for example, Precision Software's 'Disk Doctor' has a 'Report' option which reads an entire disk and reports read errors.

Alternatively, you might buy double-sided disks; there are a number of cheap sources of good quality disks, at prices far below those of even a year or two ago. For information you could contact me on 01-794 7241.

And Queries on program reliability:—

Dear Rae,

We bought Mastertronics' 'Mr Puniverse a few weeks ago. But after 6 or 7 stages the picture goes completely and we get BREAK 5 continuously all over. We changed the tape, the bought the game from another shop but these were the same. We have had no trouble with other tapes.

Mrs E. Smith, Ross-on-Wye

Dear Rae,

I think 'Alternate Reality' is the best role player game in the UK. The unfortunate thing is that the game is full of bugs. My dealer explained that maybe it was the chips in the 128 in 64 mode, so I tried it on a 64. Some bugs are: the sun turns into a big flashing square/when you have filled up with potions a further quaff will crash the game/the text half of the screen sometimes crashes in the tavern.

M. Harnden,

I haven't tried either game, and can't endorse (other otherwise) your comments. But it does seem that you've found genuine bugs, since they appear to be repeatable.

I don't think there's much point asking dealers about this sort of thing: the people to contact — if the bugs bother you enough — are the original publishers, who in many cases are in the U.S.A. You may even be able to get more recent versions with the bugs taken out — if the publishers have taken the trouble to produce new version(s) which may be impracticable for them.

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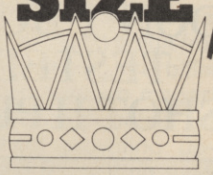

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BASIC 4.0.	X	X	X
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16 Different tape and disk commands	X	X	X
Centronics printer interface	X		X
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X = Turbo contains this function.

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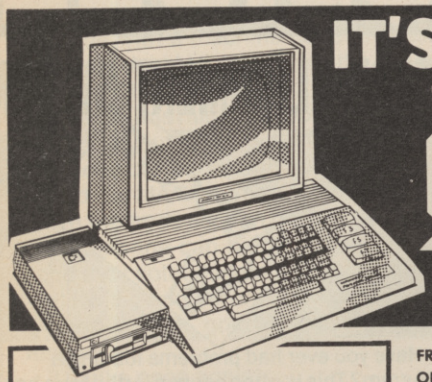

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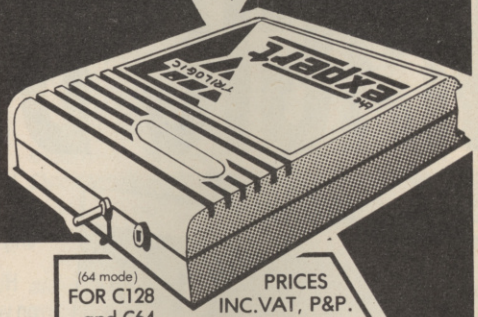

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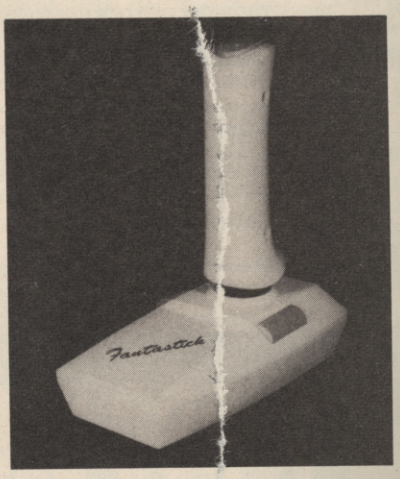

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Cnet Update

Last time we looked at Cnet, it was in a rather uncertain state, with its future in the balance. Commodore have now stopped financially supporting Cnet, and after a shaky few months, the company has managed to climb back on its own two feet, growing, it seems, stronger in the process.

The system has also grown both in size and in capacity and can now handle over twice the number of users than ever before. Jane Firbank, editor of Compunet told CCI that Cnet maintains a constant program of research and development into the system speed and capacity, and improvements are constantly being made by the system's technical manager Robert Foot.

Some of you will probably not know what Compunet is. (Surely not? Ed) As this is the first in a fairly regular series of articles we'll start with a brief summary of how the system originated and how it has developed over the last 18 months.

Compunet first became operational in early 1984 and in the last 18 months has undergone significant changes in both style and content. Originally the system was limited to less than 40 users, but now through the aforementioned system development it can now simultaneously handle well over 100.

Unlike other comptuer networks such as Micronet, Compunet is not an information provider (IP), but an interactive system where users can upload (make available to other 'netters) their own programs or text frames. These programs can be of any nature, from games to utilities so long, of course, as they are not pirated copies of commercially available software! One exception to this rule currently seems to be the excellent music and graphics found in recent releases, notably those in the music field by Rob Hubbard. A few months ago, 'netters started to hack out the music and graphics from games, and upload them onto the net. This was of course rather naughty of them, but there should not have been any cause for concern by the software companies whose programs were being hacked because they were effectively getting free advertising and publicity to 5000+ C64 owners. Unfortunately however several of them kicked up a fuss, and for a while all uploading of hacked music and graphics was banned. After extensive wheeling and dealing by the charmingly adroit Jane Firbank, the companies finally realised that it was actually beneficial to them and some of them are now even going so far as to compile demos of their latest release for uploading!

This started a chain of events that has gradually turned Compunet into a major source of talent and programming skills for software houses writing C64 programs. Most of the best UK programmers have Compunet accounts and use the system regularly including such as Jeff Minter and Tony Crowther, exchanging routines and discoveries and helping new users, or veteran programmers with their games. A lot of new talent has also been discovered, at least 20 'netters are now working for well known software houses as a result of exposure of their work at Compunet.

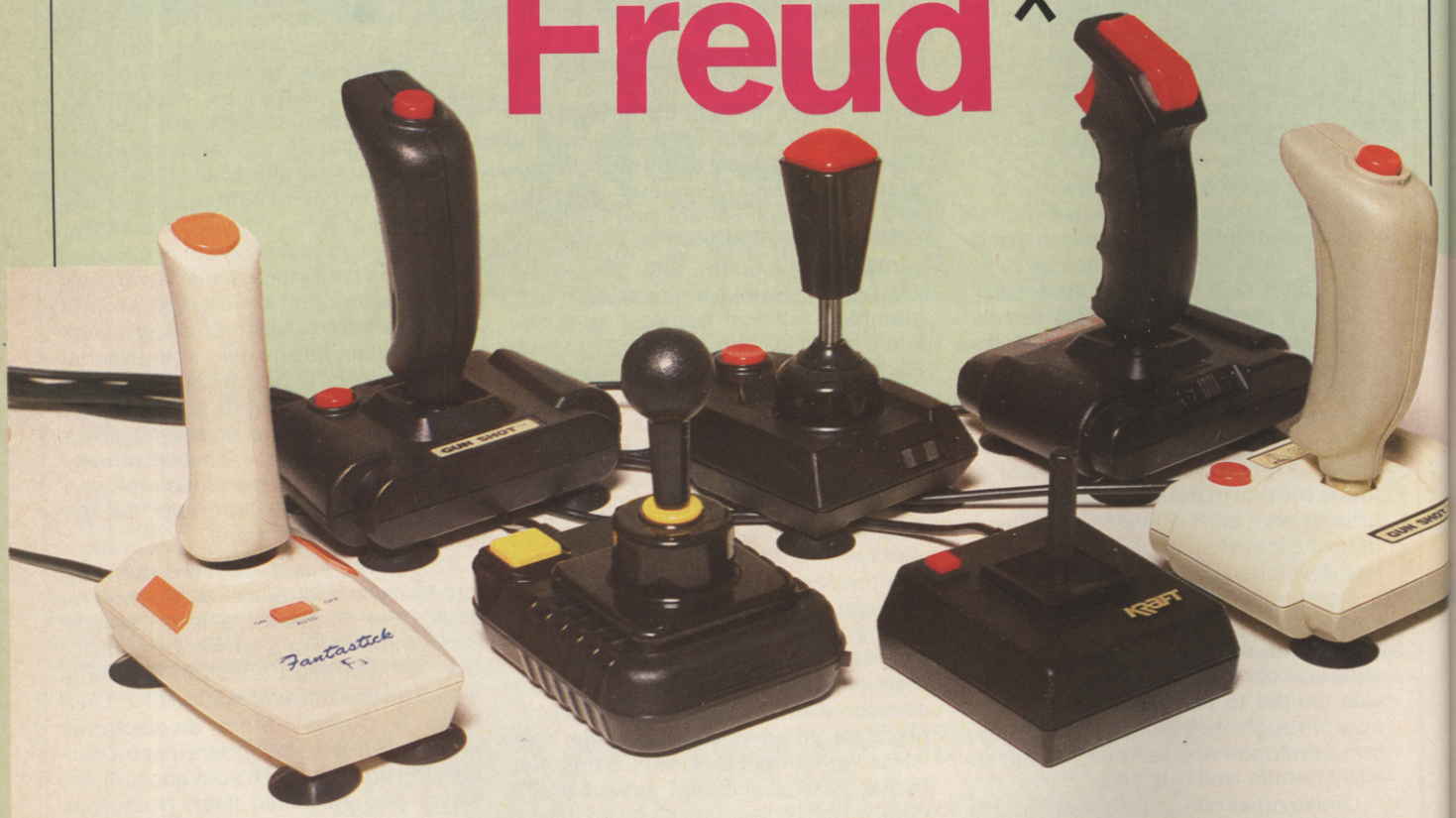
Melbourne House have been very active in this field. Rachel Davis of MH started using Compunet one night and from that day (or rather early morning) was hooked. Spending a considerable time on the chat facility Partyline she quicking contracted many of the famous names on the system and before Christmas we should see the first of their releases. One of these is Stuart Jackson (id:SJ3) who is doing the graphics for an as yet unannounced and 'classified' game. He was first contacted by Rachel via Compunet, as were many others, so it is clear that if you do have a talent that can be applied to programming on the 64, a lot of money can be made. Another of these success stories is Bob Stevenson and Doug Hare, who have formed what is informally known as 'Jocksoft'. They have been inundated with work offers and currently have more being offered than they can handle. Bob is the graphics side of the team, and Doug handles the programming. Together they are writing a game and with their collective skills the result should be pretty good!

I mentioned earlier that users can upload their own programs. The author can either levy a charge on the downloader (the person who decides he or she wants the program) or can supply it free. All it costs is a penny per day, per K. In other words if you want to store a 10k program on the 'net for 10 days, then it will cost you 100p. It should be noted however that although you can charge people for your programs, Compunet take a sizable chunk from your charge for every purchase made, but when you think of what it is costing you to distribute, this becomes negliable. Many software houses are finding that Compunet is a very effective medium for distribution, and sales are quite high. Because there is no packaging involved and because Compunet can distribute the product at a fraction of what it would cost through the shops, margins are high and outlay is low. Users can buy the program and download it in a matter of minutes normally at a much lower cost than if they bought the same product from a shop. The user can download a commercial program in minutes, saving it to either tape or disk at no extra cost. This program is protected, and will only run with YOUR modem in place. Each modem has its own unique serial number in rom. So if you download Elite on your modem, it won't work on your friend's 64 unless he or she has your modem plugged in. This obviously helps a great deal to prevent piracy, and the number of Cnet programs that get hacked is very, very small.

Compunet has a lot more than just programs and Partyline. MUD, short for Multi-User Dungeon, is also available on Compunet. For a run-down on MUD, see the MicroMud article in this issue which gives a full explanation of it! Then there is Comp-U-Store; an electronic shopping service that offers instant purchasing on credit from your account, for which you are billed later. Numerous home-grown magazines such as MegaScene populate the system, some of them providing up-to-date, accurate, and interesting news, gossip and articles. There are many Special Interest Groups (SIG's), including a Metropolitan Police club! Interests on Compunet are wide-spread and you can either participate in the spirit of the system by contributing and uploading, or you can simply use the system, downloading programs, reading text frames, and using the various services offered. Whichever of these two options you choose, you'll immediately begin to see how much fun the system can be if used properly. Compunet are currently offering an absolute bargain on subscription. For £18.50 you get a modem, and 3 months GOLD subscription to the 'net. This provides you with 1000 free page-days of storage which should last you a while! There can't be a cheaper way into the world of tele-communications. For more information, contact Compunet on 01-965 8866 anytime from about 10am to 8pm. Next month there will be an in-depth look at all the services offered by Compunet, and how they compare with similar offerings from other networks.

Feature

Kraft durch Freud*



Time for another major round-up of joysticks, in a month that has seen a sudden massive influx of the beastly, but absolutely necessary, things. Those amongst you who are not game aficiandos will probably think that a joystick is just a joystick, a similar line of thought to those who say that a car is just something to get you from A to B, in whatever fashion. Anybody who is a regular player, especially of shoot 'em ups, will appreciate how much a good joystick can aid you in your quest for the destruction of the alien horde and the alien hordes get bigger all the time!

This round-up looks at seven joysticks, and suggests which of them are best for different types of game. Some are better for shoot 'em ups, some better for games requiring accuracy. Just because a stick isn't deadly accurate doesn't mean it's no good. Equally, some of the really accurate sticks aren't suitable for the fast action games. Compromises are possible, obviously, but ideally you ought to have two joysticks! Or even more. And don't think that it ought to last for ever. With the kind of wear that joysticks get it is surprising they do not break more quickly.

Kraft

This was my favourite joystick out of them all. Although based on an old design, and not particularly robust, when you start playing a game with it you feel totally in control, and with most games accuracy is crucial. The stick itself is held between thumb and index finger, and rests on the middle finger. The unit itself sits comfortably in your hand with the thumb sitting nicely on the fire button. On the base of the unit is a switch that allows you to select either 4 way or 8 way switching, so for Pacman you would set it for 4 ways to enable you to play with greater accuracy, but for a game that has you walking about, then of course 8 way is needed. This stick may not stand up to Track'n Field type games, but for anything else it must come in my top 5 favourites.

F3 Fantastick

I'm afraid that I just couldn't stick this one (groan, talk about puns — Ed). It has a soft, unresponsive feel and an uncomfortable design. Its plus point is that the buttons are well positioned, and well sprung, so fairly rapid fire is possible. There is a fire button on the top of the stick as well as on either side of the base, so it is ideal for left-handed people. It also has an auto-fire switch. The unit has the by now obligatory black rubber suckers on the bottom, but although it plays reasonably well when stuck to the table rather than hand held, your wrist tends to hit the rear edge of the base which after a few hours playing can start to get a bit tender. Out of all the joysticks we received for review this month, this one was my least favourite, but that's a personal view. When you try it you may not agree. It is good value for money at only £6.95.

* Translate and give us the origin of the phrase and we'll put your name in the Comp sack for a free Kraft Joystick (answers on a postcard by November 15th)

Gunshot CL123 and CL128

These two joysticks are identical save for one item, the auto-fire switch. The CL128 has one, and the CL123 doesn't. Both models are available in either cream, white or black, though I think the white one is a lot more attractive. Yet we hear that retailers find selling black joysticks much easier. Strange! The Gunshot is based on an old design, but nevertheless a good one that has proven itself over the years to be sturdy and reliable. It reminds me of the old Quickshot I. There are buttons on the top of the grip, and on the top left of the base, so left-handed players who want to use the base button would find it a bit of a problem! There is also no grip on the stick itself; just a smooth surface.

As with most sticks these days, the Gunshot too has the rubber suckers on the underside of the base, and sticks down firmly, which is one of the advantages of having such a wide unit. Play testing this stick I found it a little stiff and not sensitive enough, but hence reducing accuracy. Apart from this it's not bad at all and is certainly sufficiently sturdy to withstand a good deal of bashing. One advantage of the stiff stick is in Track'n Field games, where a quick return means faster wiggling, (wiggling? Is that how you spend your time wiggling your joystick. Disgusting! Ed) and a better score.

The Professional

Along with the Kraft, this was my favourite joystick. It really is a professional unit and is very accurate. Styled in a Kempston Coin Pro design, with feather-touch switches under the fire buttons and a very sensitive stick, you really get good feedback from The Pro. It makes a strangely satisfying clicking sound every time you move or fire as the switches close, and you really get the feeling of being in control. This is the best stick I have used for shoot'em ups. I tried it on the ultimate SEU (shoot'em up), Iridis Alpha, Jeff Minter's new game and got further than I ever had before, and that must be a good recommendation for any joystick!

It has no rubber suckers on the base, but fits so comfortably in the palm that they aren't really needed. Unlike the other sticks, this one is fairly heavy which gives you the feeling of holding something really strong and robust, which of course it is! Highly recommended.

Quickshot II plus

The strong Quickshot series has been running for some time now, but this time Palan really surpassed themselves. The QS II like the professional is incredibly marvellously noisy! I don't know which switches they've used but I have never heard a joystick click so vigorously and confidently.

The whole unit is very robust and feels as though it could stand up to a real hammering. It has two very large buttons on top of the stick, and at the top of the grip, where the index finger rests. The auto-fire switch is situated just behind the grip, which is contoured for the three bottom fingers. It has an easy, unsprung, relaxed feeling. I liked this stick, even if it is a bit chunky! It feels as if it could really be one to stand up well for a long time under a lot of presssure. Recommended.

The Microswitch

The only reason I prefer The Professional over this stick is because of its unusual shape. The stick itself is a black elongated knob, with a large rounded red fire button on top, which is mounted on a metal shaft. It is also rather bulky, but on suckers sits nicely on the table.

Above all, it is very accurate, with a strong feeling of feedback when you move it. The thumb buttom gives a satisfying click when you press it, and is very fast. Rapid fire even without turning auto-fire on is fairly easy. The stick is nicely sprung too, with a good balance and fast response. It is also very good value for money at only £11.95 for a very high quality joystick.

Vulcan	(Tel: 01-203 6366)
Microswitch	-£11.95
Kraft	-£9.95
CL128	-£7.95
CL123	-£5.95
Euromax	(Tel: 0262 601006
Professional	-£19.95
Palan Electronics	(Tel: 01-330 0101)
Quickshot 11 +	-£13.95
Fantastick F3	-£6.95

Choosing a Stick

Joysticks are a totally personal thing. My tastes are not likely to be yours. So find yourself a good retailer (No, it isn't impossible!) and make sure

1. Stocks *all* the new Joysticks we've covered here.
2. Test them all yourself.
3. If in doubt contact the manufacturers and ask where you can see their range.
4. Don't expect any stick to last forever. If you got that kind of bashing you wouldn't last 5 minutes!

ISAM- The Key to Data Files

When using files of mixed type data (Alpha and Numeric data items) the access of a particular record is normally restricted to one of two methods, even if a key data item within the entry required is already known. If the file is small enough a simple record by record pass of the file is adequate. However, once a critical number of records is reached the time taken in finding a record is longer than the action to be carried out on the record itself. The usual solution to this problem is to use a relative file with each record having a unique relative record number. The drawback with this approach is that the relative number needs to be known before the record can be read. In a list of names and addresses this soon becomes difficult unless a manual file is kept of names to relative key numbers.

The solution to remembering or having easily available the key to the record is not to use a substitute number but the characters of the key itself. A file of names and addresses would normally be keyed on name and a file of vehicle details on registration number (i.e. SMITHF or C123ABC), neither of which easily converts to a unique numeric number. The answer is the 'Index Sequential Access Method' or ISAM for short.

Data stored using ISAM still has a relative key assigned to it, the difference in processing occurs in the linkage of that relative number to the true key of the record (i.e. SMITHF). The basis of ISAM is two files, a DATA file and an INDEX file. The DATA file is exactly the same as under normal relative access methods. The INDEX file contains the Alpha key to the Relative Number index details. The INDEX file is also stored using a relative file format but that is for a different reason than the data file. Two types of records are stored on the INDEX file and these are designated 'Bucket' and 'Index'.

Index Records

These are records that are as long as the maximum allowable. Groups of two fields are held on the record, the Alpha key (SMITHF) and its relative record number on the DATA file (1234).

Bucket Record

These records are again of the maximum allowable and contain groups of three fields, a relative record number of either another 'Bucket' record or an 'Index' record and the minimum and maximum Alpha key fields related to that record, for which the relative keys for that range can be found. The INDEX file is held in relative form to allow quick access for Bucket to Bucket and Bucket to Index linkage.

A simple example using ISAM can be seen in Fig. 1. To find the data record for the car with registration B123ZXY the sequence of accesses is as follows.

1. Access the 'Bucket' record in the INDEX file.
2. Search for the range in which the required record occurs and use the given relative key to obtain the 'Index' record for that range.
3. Access the 'Index' record in the INDEX file.
4. Search for the required key and use the given relative key to obtain the data record itself.
5. Access the data record from the DATA file.

The arrows on Fig. 1 show the sequence of retrieval.

While from the example this does not look anything special, when the maximum numbers of entries addressable are taken into account the picture looks quite different. From the example in Fig. 1 and a Commodore maximum record length of 256 characters (1 sector) the following figures emerge.

1 BUCKET record will hold 12 ranges
1 INDEX record will hold 17 data file relative record numbers

Therefore the total number of records addressable would be 204 (12 x 17). This means that any record in that 204 can be obtained with 3 disc accesses. Using normal sequential methods this would take an average of 102 or using a relative file would require remembering which of 204 numbers was the one required.

To take this further there is no limit on the levels of 'Bucket' records in the INDEX file because a 'Bucket' can hold ranges of lower level 'Bucket' records. Each level increases the number of records addressable by a multiple of 12 (ranges per bucket) but only increases the disc access by 1. In tabular form this gives:

DISC ACCESS	ADDRESSABLE RECORDS
4	3460 (204 x 12)
5	58956 (3460 x 12)
,,	,,
,,	,,

Commodore's larges floppy disc drive the SFD1001 gives 1.1 megabytes of store which again using the example in Fig. 1 would hold 36000 car records. As you can see, using ISAM, ANY record on that file can be retrieved with only 5 physical disc accesses. When compared with sequential or relative methods this is very impressive.

While all this sounds complex the idea behind it is quite simple. The INDEX file is cramming as much information as possible into one disc access and by using a tree structure of ranges is reducing the total number of accesses even further. Logically it has still 'read' every key in the file before it finds the required entry.

Some further advantages of this are not so readily apparent. The DATA file can be stored in any sequence, entry sequence in fact, which means it can be kept as small as possible (no empty entries for unused keys). The INDEX file is automatically sorted into the alpha key sequence without any additional programming. Once the record is found the DATA file can be read sequentially by reading the INDEX file in sequence for each DATA file key.

I hope the examples have shown you the power of the ISAM method, so powerful in fact it is still on the large computer mainframes such as IBM as a quick way of retrieving a record from a high volume data file.

Fig. 1

Search key = B1232XY

Data File

Record	Car Reg.	Make
14	X912ZAB	Rolls-Royce
22	A123ABC	Volvo
23	Z987ZXY	Ford
33	B123ZXY	BL
104	B987ABC	Vauxhall

(Total record length = 30 bytes)

Index Record

(Relative No. = 3)

Entry	Key	Data File Rel. No.
1	B123ZXY	33
2	B764ABC	23
3	B987ABC	104

Index File

(Bucket record)

Entry	From	To	Index Rec. No.
1	A000AAA	A999ZZZ	1
2	B000AAA	B000ZZZ	2
3	B001AAA	B900ZZZ	3
4	B901AAA	B999ZZZ	4

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ADD-ON GUIDE

MONITORS

Product	Features	Price	Company
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BM 7522	LA Phosphor, amber screen 12″ Mono	£97.95	Philips
BM 7542	WD Phosphor, Paper white screen, 12″ Mono	£97.95 £97.95	Philips
BM 7513	P39 Phosphor, green screen 12″	£122.95	Philips
CM 8500	Std. resolution, grey glass screen 14″	£222.95	Philips
CM 8501	Std. resolution, grey glass screen RGB 14″ colour	£243.95	Philips
CM 8524	Std. resolution, dark glass etched screen, composite video + RGB 14″ colour	£279.95	Philips
CM 8533	Med. resolution, dark glass etched screen, composite video + RGB 14″ colour Compatible with 64, +4, 16, 128, PC	£314.95	Philips
CM 14	14″ monitor, RGB, Scart, composite video. Colour.	£179.99	Fidelity
KX 14 CPI	14″ monitor, new and specially designed unit for use with personal computers. High resolution, video input connector enables it to be used with VTR or TV tuners and direct broadcast satellite.	£499.00 RRP ex.vat	Sony
1431 AP	14″, standard resolution, low complexity colour display, high quality resolution	£259	Microvitec
2030 AP	20″, standard or high resolution	£465	Microvitec
CM 31481 VI	80-column text display,	£270	Thomson
VM 3102 VG	Flat-face monitor with green text (amber text-VM 3102 VA)	£85	Thomson
CM 36632 V	40-column text display, built in speaker	£189	Thomson

PRINTERS/PLOTTERS

Product	Features	Machine	Price	Company
MT-85	9 × 9 dot matrix. Max print speed 180 cps. NLQ mode 45 cps. Max paper width 10″. Fully IBM and Epson compatible.	64, VIC 20 (needs 'black box')	£380.00 £380.00	Mannesman Tally
MT-86	As above. Max paper width 16″	64, VIC 20 (needs 'black box')	£460.00	Mannesman Tally

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MPS-802	Serial impact dot matrix. Max print speed 60 cps. Pin feed and friction. Max paper width 10″. Serial interface.	64, VIC 20, 16, +4 128	£345.00	Commodore
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HR-5	Thermal printing 9 × 9. Max print speed 30 cps. Max paper width 80 columns.	64, VIC 20	£110.00	Brother
P-40	Dot matrix 9 × 6. Max print speed 45 cps. Max paper width 40 columns. Parallel or serial interface.	64, VIC 20 (needs 'black box')	£52.13 RRP	Epson
Rotronics DX-85	9 × 9 dot matrix. Max print speed 120 cps draft. NLQ available. Max paper width 80 columns. Friction and pin feed and automatic and single sheet loading. Bit-mode (graphics) operation allows printing of graphs and special tables.	64, VIC 20	£233.95	Rotronics
SG10C	Specifically for Commodore machines. 9 × 11 dot matrix. 2K buffer. Max print speed 120 cps draft. NLQ mode. Max paper width 10″. Detachable tractor feed. Parallel interface with option of serial interface.	64, VIC 20, 128	£225.00	Star
SD10	9 × 11 dot matrix. Friction and tractor. 2K buffer. Max print speed 160 cps draft. NLQ mode. Max paper width 10″.	64, VIC 20 (needs 'black box')	£389.00	Star
SD15	As above. 16K buffer. Max paper width 15″.	64, VIC 20 (needs 'black box')	£489.00	Star
The Powertype	Daisywheel printer (Qume). Parrallel interface and also built-in serial interface. Max print speed cps.	64, VIC 20 (needs 'black box')	£229.00	Star
MT-80	9 × 8 dot matrix. Can handle all the Epson codes. Max print speed 100 cps (uses square 'needles' for good print quality). Max paper width 10″.	64, VIC 20 (needs 'black box')	£217.00 £195.00	Mannesman Tally
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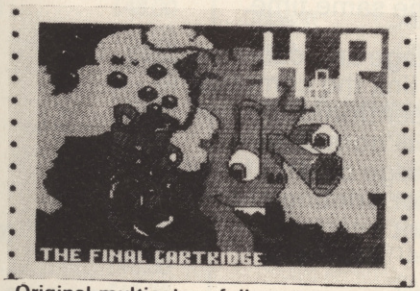

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LX-80	18 × 12 dot matrix. Single sheet and continuous with Automatic Feeder optional. Max print speed 100 cps draft, 16 cps correspondence. Max paper width 254 mm. 1K buffer. Parallel centronics standard.	64, VIC 20, 128 (needs box)	£255.00	Epson
H-180	10 colour Printer Plotter. Graphs, solids, outlines or cross hatching. Matt, gloss paper and film. A4. Parallel centronics standard. Serial optional	64, VIC 20	£400.00	Epson

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INTERFACES

Superbox 64	Expansion unit which features three independent cartridge slots, IEEE interface that is totally transparent. Reset switch activates cold start on computer. Will connect up to 3 cartridges at the same time.	64	£67.85	Handic
The Commodore Connexion	Software package and cable enables the 64 user to link the computer to any standard centronics printer. Has two modes — a 'normal' mode providing carriage control facilities and 'mode 2' for printing characters direct. Does not interfere with user memory.	64	£19.95	SMC
Comprint	Two internal versions (Epson and Canon), just plug in and connect cable. 2K buffer storage. 8K buffer storage £113.85 — stand alone version.	64,C.16 2K Epson 2K Cannon 8K cannon 8K Epson	 £58.65 £63.25 £80.50 £67.85	Micro Control
92000/G	In addition is able to print all CBM special characters, block graphics, CBM single point graphics etc. Built-in DIL switches.	64, C.16, C. 128, +4	£59.99	FCC
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	Star Disk (S. Francisco) (d)	£20.00
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Submarine Simulations

S.H.	Gato (d)	£24.00

Space Simulations

SSI	Imperium Galactum (d)	£33.00
SSG	Reach for the Stars (d)	£39.00
Cygnus	Star Fleet (d)	£44.00

War Simulations

Avalon Hill	*Panzers East (d)*	£33.00
	Legionnaire (d)	£33.00
	Dreadnoughts (d)	£33.00
	Tsushima (d)	£33.00
SSI	Breakthrough in the Ardennes (d)	£40.00
	Computer Ambush (d)	£48.00
	Kampfgruppe (d)	£48.00
	Battle Group (d)	£48.00
	Mech Brigade (d)	£48.00
	Operation Market Garden (d)	£48.00
	Colonial Conquest (d)	£33.00
	Carrier Force (d)	£40.00
	Wings of War (d)	£33.00
	50 Mission Crush (d)	£33.00
	Geopolitique (d)	£33.00
	Field of Fire (d)	£33.00
	Cosmic Balance (d)	£33.00
	Six Gun Shootout (d)	£33.00
	Fighter Command (d)	£48.00
	USAAF (d)	£48.00
	Panzer Grenadier (d)	£33.00
	Battle of Antietam (d)	£42.00
	Nam (d)	£33.00
	Battalion Commander (d)	£33.00
	Gettysburg (d)	£54.00
	Seventh Fleet (d)	£54.00
	Fifth Eksadra (d)	£54.00
Sim Canada	Golan Front (d)	£48.00
	Grey Seas Grey Skies (d)	£48.00
	Fall Gelb (d)	£48.00
	Sieg in Africa (d)	£48.00
SSG	Carrers at War (d)	£48.00
	Europe Ablaze (d)	£48.00
	Battle Front (d)	£54.00
Barac	Road to Moscow (d)	£39.00
DKG	Clash of Wills (d)	£49.00

Business Simulations

SSI	Cartels & Cutthroats (d)	£33.00
	Rails West (d)	£39.00
Bluechip	Millionaire (d)	£33.00
	Tycoon (d)	£33.00
	Baron (d)	£33.00

Sports Simulations

SSI	Computer Quarterback (d)	£33.00
	Ringside Seat (d)	£33.00
	Prof. Tournament Golf (d)	£33.00
Sublogic	Football (d)	£35.00
Avalon Hill	Superbowl Sunday (d)	£33.00
Epyx	Baseball (d)	£33.00

Fantasy Adventures

Avalon Hill	Mission to Jupiter (d)	£35.00
	Quest of Space Beagle (d)	£35.00
SSI	Phantasie II (d)	£33.00
	Wizard's Crown (d)	£33.00
	Rings of Zilfin (d)	£33.00
Datasoft	Alternate reality (d)	£14.00
Origin	Ultima IV (d)	£50.00

Text Adventures

Broderbund	Brimstone (d)	£39.00
	Essex (d)	£39.00
	Mindwheel (d)	£39.00
Infocom	Ballyhoo (d)	£39.00
	The Witness (d)	£39.00
	Spellbreaker (d)	£39.00
	Trinity (128, 80 cols)	£39.00

Graphic Adventures

Telarium	Amazon (d)	£19.00
	Dragonworld (d)	£19.00
	Fahrenheit 451 (d)	£19.00
Polar	Oo Topos (d)	£39.00
	Carmen S. Diego	£39.00

All prices include VAT. Add £1.00 for p&p

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ADD-ON GUIDE

The Connection	Fully intelligent Parallel Printer Interface designed exclusively for Commodore computers. Plugs into the disk (serial) socket and translates Commodore ASCII to standard ASCII. Provides two modes. 2K buffer. Also features an on-board printer test to isolate problems.	All	£84.95 for the Epson version £79.95 for all other models	Tymac
PRINT 64	Serial IEEE to Centronics interface. Two leads, one plugs into the serial port on either the computer or the disk drive and the other into the printer. Includes Supply Connector Lead for cassette port. Commodore graphics characters, normal and inverted. Can assign any PRINT 64 function to any program's secondary address.	64	£76.95	Jansen
Ibek Interface	Built-in functions.	64	£59.95 +VAT	Data Star
Parallel Interface	Compatible with existing software; plugs in direct; device number can be altered; 16K printer buffer option	64, VIC,	£44.95	Zero Electronics
Super Graphix	8K buffer; 10 printing modes re-set button; internal fonts	64/128	£49.95	Screens

MODEMS

Product	Features	Machine	Price	Company
TM 110	1200/75 bps V23 full duplex mode. Able to store and access data in its own CMOS RAM. RS232 micro interface, auto-dial/auto-recall and auto transmission of ID. Up to 8 telephone numbers can be stored.	64, VIC 20	£99	Tandata
WS 2000	Single-unit multi-standard, multi-speed, offering a very wide choice of operational facilities. Can transmit and receive at 300 baudfull duplex, 600 baud half duplex, 1200 baud half duplex and Prestel/Telecom Gold.	All with RS232/serial interface	£125.00 inc. VAT	Miracle Technology
WS 3000 V2123	Fully intelligent, keyboard-instructed, autodialling, auto-answering. Supports both CCITT and Bell standards, 60-number internal telephone directory, speed buffered RS232 port. Allows 300, 600, 1200, 1200/75 and 75/1200 baud rates.	All with RS232/serial interface	£295.00	Miracle Technology
WS 3000 V22	Adds 1200 baud full duplex	All with RS232/serial interface	£495.00	Miracle Technology
WS 3000 V22bis	Adds 2400 baud full duplex. Protect 3000 Data Security Option £98 when purchased with modem.	All with RS232/serial interface	£650.00	Miracle Technology

ADD-ON GUIDE

Commodore Communications Modem	1200/75 V23 full duplex, asynchronous operation. Easy to fit, easy to use. Connection direct to the cartridge port of a 64 and direct to a British Telecom series 600 socket. Compunet software held in ROM (8k) for immediate interaction after switch on. Soft load options provide 64 to 64 direct communication. One year's free subscription to Compunet.	64+ 128	£99.99	Commodore
Multimodem	Multi-speed, baud rates of 300/300, 1200/75, 75/1200. Auto-dial, auto answer, auto-mailbox	64	£98.50	Miracle
Tm512E	Auto-dial, auto-answer	64	£339	Tandata
Voyager	Operates V21 and V23. Auto-dial, auto-answer, optional add-ons	64	£79.95	Modem House
WS4000 modem	Speeds vary, top model has V21, V23, V22, V22bis, Hayes command set, Auto dial/answer, speed detect		Various according to model	Miracle Technology

MUSIC ADD-ONS

Product	Features	Machine	Price	Company
Music Maker	Starter program. Turns 64 into keyboard.	64,128	£19.99	Music Sales
Playalong Albums	3 available: Pop, Classics, Beatles. 12 songs. Auto playback or will teach to play melody.	64,128	£9.99	Music Sales
Sound Studio	2 programs in 1. (1) Turns computer into synthesizer. On screen controls. 60 sounds in memory. (2) Sound recording studio (3 channels). Real step time.	64,128	£14.99	Music Sales
Sound Sampler	Hardware & software package with audio lead and mike. Samples and digitizes sound. Editing facilities. Pitch sampler. Drum & echo facilities.	64,128	£69.99	Music Sales
Sound Expander	Hardware & Software package. Gives 64 extra sounds. Turns computer into generator using F.M. technology. Enables 11 voices to be used at one time. Easy play features built in.	64,128	£99.99	Music Sales
Tron Digidrum	Hardware/software package. Using 64 'live' or real recorded drum digital samples the Digidrum allows patterns and songs to be built up and recorded. Software comes complete with 16 samples, 8 standard kit and 8 glass samples. Demo songs and patterns provided. Audio and trigger outputs.	64	£79.99	

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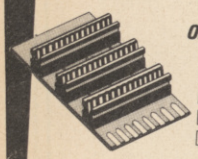
THE NO 1 NAME FOR COMMODORE

Save wear on your expansion port: 3 slot Motherboard for 64/128



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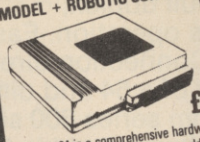

ROBOTEK 64

£39.99 POST FREE

Robotek 64 is a comprehensive hardware/software package to interface your 64 to the outside world, models, robots, lighting, sensors etc., etc. The features make Robotic 64 the most sophisticated unit available at any price:

- 4 output channels each with on board relay. • 4 digital inputs fully buffered. • Analogue input with full 8 bit conversion.
- Sound input for voice recognition and voice controlled switching.

☐ Software features: sequencers to control output. Analogue measuring module. Test Program. Voice Activation Module, much, more. Voice recognition software to be released soon. Total package no more to buy!

TURN YOUR MPS 801 INTO 4 PRINTERS IN ONE! WITH

PRINTER IV

Alternative Character ROM Fitted in minutes – No soldering required

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- At the flick of a switch you can choose between any of 4 different superb new character sets:

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- All 4 sets can be mixed within one document
- Printer IV is a direct replacement for the normal printer ROM so it is 100% compatible with your existing software.
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A complete kit of parts for an 8K 16K Autostart Cartridge including:

- High quality double side PCB
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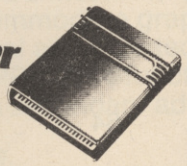
- Cartridge can be configured in many ways full instructions in "Cartridge Development Handbook"

A MUST FOR THE DISC HACKER

Super Snooper

Track and Sector Editor Cartridge



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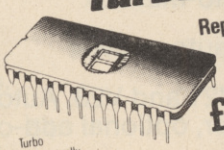
Super Snooper lets you examine decode and change any program directly on the disc in your drive.

- Gives readout of each sector/track in Hex, Decimal and ASC II
- Built in powerful disc ram monitor/disassembler. Unprotecting, adding pokes and making backups are made easier with the Super Snooper. Since most disc protection schemes are never loaded into the computer ram, a track and sector editor is invaluable tool when making back ups etc.

Turbo Rom

Replacement Kernal



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Turbo Rom actually fits inside your computer and replaces the normal slow Kernal Rom with superfast disc loading routines, plus extended DOS commands.

- Loads most programs at 5-6 times speed
- Improved single key commands
- Fits inside computer so all ports are free
- Return to normal kernal at flick of switch.
- Fitted in minutes – no soldering usually needed (on a few C64's the old Rom may have to be de-soldered).

Disc Utility Cartridge

Disk Mate

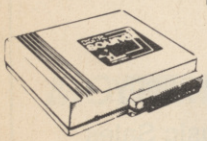
ONLY **£12.99** POST FREE **NEW**

A multi feature cartridge for the disc drive user.

- FAST DISC COPIER copies entire disc in 4 minutes even many protected programs.
- FAST FORMAT format an entire disc in 10 seconds.
- FAST LOADER loads many programs at 5-6 times normal disc speed
- IMPROVED DOS COMMANDS single key commands for: Directory, Load, Scratch, etc., etc.
- POWERFUL MONITOR/DISASSEMBLER view any area as full disassembly or HEX/ASCII. Features including: Move, Find, Fill, Compare, Assemble, Screen or Printer, too many features to list.

DIGITAL SOUND SAMPLING

COMPLETE PACKAGE



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FREE AUDIO (TV LEAD!)

NOW FOR YOUR COMMODORE 64

The Datel Sampler now brings you this technology at a sensible price!

- The Sampler allows you to record any sound digitally into memory and replay it instantly at any pitch, backwards, forwards, ascending scale, descending, with echo, reverb, flanging, endlessly looped etc. Truly professional hardware incorporating:
- Full 8 bit D and ADC conversion.
- Line or MIC input, line output and feedback control.

A comrehensive software package including:

- A live effects menu with echo, reverb, digital delay, etc.
- Full sample editing facilities with review and on screen frequency plotting.
- A powerful real time sequencer.

Available now complete hardware/software package. Complete with microphone. Please state disc or tape software required.

COM-DRUM

ONLY **£29.99** POST FREE

SPECIAL OFFER AUDIO/TV LEAD (WORTH £4) FREE!!

DIGITAL DRUM SYSTEM FOR THE C64

Now with the Com Drum digital system you can produce studio quality drum rhythms with real drum sounds. All the features of systems 10 times the price.

- A complete digitally recorded drum kit, i.e. 8 voices – kick drum, snare, tom tom, hi hat, cymbal etc. etc. N.B. these are real drum sounds – not synthesized.
- Real time and step time sequencers. • Full editing system.
- 16 Alternative voices supplied free • More voices to be released (price to be about £5.00 for 32 voices tape or disc).
- 8 pre programmed rhythms to start you off • External sync facility • Very simple to use. • Line output to hi fi/amp or through TV with optional audio TV lead (see offer). • On-screen menus. • Stylish case • Please state tape or disc software.

AVAILABLE NOW! •

£9.99 ONLY POST FREE WHEN PURCHASED WITH THE SAMPLER
COM-DRUM SOFTWARE ONLY, TO WORK WITH THE DIGITAL SOUND SAMPLER

THE ULTIMATE BACKUP ACTION... CARTRIDGE IS HERE

FOR C64/128

ONLY **POST FREE £24.99**

REPLAY MK II

NEW IMPROVED PLUS VERSION

FAST LOADER SYSTEM *Two cartridges in One!!*

Stop the Action of your game and make a complete backup to TAPE or DISK

☐ Action replay takes a 'Snapshot' of the whole program in memory. It does not matter how it was loaded – From Tape or Disc – at normal or turbo speed. Therefore tape to tape, tape to disk, disk to tape or disk to disk backups are easily made.

☐ All backups will reload at turbo speed and run independently of the cartridge.

☐ Special compacting techniques to save disk space.

☐ Even copes with many programs that load extra sections (tape).

☐ Screen Dump Feature.

UNIQUE CODE INSPECTOR FEATURE

☐ Stop the Action with the button and inspect the whole program including all the VIC and SID registers etc.

PLUS BUILT IN FAST LOADER CARTRIDGE

Action replay is actually two cartridges in one. At the flick of a switch you have a loader cartridge that will load your normal speed software 5-6 times faster.

EVEN THE LATEST HEAVILY PROTECTED SOFTWARE

In our most recent tests we could not find any memory resident game that could not be backed up.

MK 1 Action Replays can be upgraded for £8.50 SEND NOW!!

If you have a C64 – you need an **ACTION REPLAY**

IT'S HERE... **AMERICA'S BEST SELLING DISK BACKUP SYSTEM NOW AVAILABLE IN THE UK!**

FAST HACK'EM™

BY MIKE J. HENRY

FOR THE COMMODORE 64/128

A MULTI-MODULE SYSTEM - ALL ON ONE DISK

£19.99 POST FREE

FAST HACK'EM IS QUITE SIMPLY THE BEST DISK COPYING SYSTEM AVAILABLE, ANYWHERE AT ANY PRICE.

SIMPLE TO USE FULLY MENU DRIVEN

SINGLE 1541 MODULE

- AUTO NIBBLER: Copy an entire protected disk in 3 minutes. Automatically senses type of protection and treats it as normal data to produce working copy.
- NIBBLER: Copy and entire disk in 2 minutes. As above but parameters can be set manually.
- FAST COPY: Copy a disk in under 2 minutes.
- FILE COPY: Copy and file in 9 seconds.
- FAT TRACKER: Fat tracks are amongst the latest forms of protection. This mode allows you to produce a fat track on the disk.

SINGLE 1571 DRIVE (64 OR 128 MODE)

- FAST COPY: Entire 1571 disk in under 1 minute.
- SINGLE OR BOTH SIDES. Will copy C64 or true 128 software.
- C64 or 128 Modes.

****WARNING****

FAST HACK'EM IS A VERY EFFECTIVE PRODUCT DESIGNED TO ENABLE USERS TO MAKE BACK UP FOR THEIR OWN USE – DATEL IN NO WAY CONDONES SOFTWARE PIRACY.

BECAUSE FAST HACK'EM IS PRODUCED IN THE U.S. IT WILL ALWAYS BE ON TOP OF THE LATEST PROTECTION TECHNIQUES. SINCE MANY OF OUR LATEST PROGAMS APPEARED IN THE U.S. MANY MONTHS AGO.

TWIN 1541 DRIVES MODULE

- AUTO NIBBLER: Copy an entire protected disk in under 1 minute. Features auto track/sector analyzer.
- FAST COPY: Copy entire disk in 36 seconds with verify.
- AUTOMATIC FASTCOPY: As above but with completely automatic operation. In fact once set up doesn't even need the computer. A must for duplicating disks on a large scale.

1541 PARAMETERS MODULE

This is the module that gives Fast Hack'em its power. The parameters module contains dozens of "Parameter Keys" that are used to unlock those heavily protected programs. Each parameter is designed for a particular software brand or even a particular program. Other copy programs may make strong claims, but without special parameters they just can't cope. Datel will be offering updates to Fast Hack'em on a quarterly basis, featuring 20-50 new parameters plus other improvements as they're made. Prices to be £6 plus old disk.

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ADD-ON GUIDE

Sound Set 1	Disk containing over 50 new samples for Syntron Digidrum. Latin and Syndrum kits plus full selection of tom-toms, sweep, pitchbend toms, cymbals, hihats, Latin effects and syndrum effects. Also in cassette.	64	£17.99	Syndromic
Digital Music System (Microsound)	Designed to provide the ability not only to play back the sampled sounds at various pitches, but also to create complex sounds using Dynamic Amplitude Modulation, Definable Pointer sets, Looping, Reversing, and mixing different sample sounds. Keyboard is a full size 4 octave unit that connects to the 64 via the games ports and requires no external power supply.	64	£165.22	Autographics
RMS 6H	JMS Midi Master Synchronizer allows synchronisation of conventional trigger signals and Sync Signals with MIDI synchron code. All Sync Codes are available simultaneously at the outputs, with each capable of controlling several devices.	64	£239.00	Syndromic
RMS 20C	Midi Multitrack Composer. An effective step time Composer program offering six channels with Computer input one note at a time. Editing facilities include pitch, gate time, velocity, sound changes and transfer.	64	£49.95	Syndromic
Microvox	Package consists of sampling unit, system disk (with 'start-up' samples) and Library disk. The sampling unit has two programmable 24dB/octave filters and gives a S/N ratio of 59 dB.	64	£229.95	Supersoft
Siel CMK 49	Music Keyboard, 4 octaves, fits directly to expansion port, software allows complete control over SID chip, programming in mono and poly modes, MIDI Master Keyboard function w/split facility, 125 sounds per file possible, 40 sounds available, demo songs.	64	£125.00	Syndromic
Siel Sound Buggy	Comes complete with overlay clip-on keyboard but can be controlled via the CMK 49 keyboard. Allows the user complete control over a new sound chip, programmable sounds, rhythms, single finger/fingered chords, split keyboard, auto-accompaniment includes arpeggio, bass, vibrato, memory plus chord and melody sequencer, demo songs, sounds and rhythms already programmed, MIDI facilities include Receive/Transmit plus channel and program change for four individual MIDI lines	64	£99.00	Syndromic

ADD-ON GUIDE

Disk/Wafer Drives

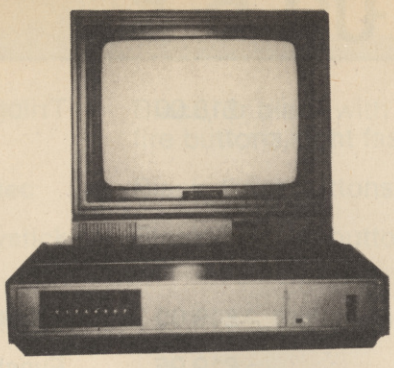
Product	Features	Commodore Machine	Price	Company
1541	Single disk drive unit, provides greater storage capacity (170 Kbytes) — faster retrieval than a cassette unit	64 128 +4	£199.99 (with dot matrix printer)	CBM UK
Wafer drive	High speed load	64	£59.95	Micropride
Triton Quick	Disk drive — takes 8 secs. to load a	64	£119.95	Radofin
1571	Double-sided, fast access times, quiet in operation, half height	128 64 — when used with 64 it is basic compatable	£249.00	Commodore
Enhancer Disk Drive	High data transfer rate, sleek design, 1541 compatible, free software	C64/128	£115+VAT	Firstline Software

Speech Recognition & Synthesis

Product	Features	Commodore Machine	Price	Company
Sweet Talker	Synthesiser — allophone system, 3" square, 1½" high, gives examples & demonstrations. Shape & colour as Commodore	64	£24.95	Cheetah
Voicemaster	Unique 3-in-one package, speech reproduction, speaks in own voice. Voice harp — just whistle or hum to produce music	64	£59.95	Anirog
Currah Speech 64	"Y" cable available, converts text to speech direct from screen, uses allo-phones system, infinite vocab.	64 (compatible with C128)	£21.95	Welwyn Electronics

SPEED LOADERS

Product	Features	Machine	Price	Company
Epyx Fast Load Cartridge	Has disk tools e.g. directory, return to basic function, copy (another menu). Can be disengaged without turning off machine. Can edit disks, has a file utility, For trans-programming you have S. Mon. which is a powerful monitor. Numbers may be entered in hex.	64,128	£24.95	Centresoft
Robcom Turbo range	Alignment tape kit included in package. 8 pre-programmed function keys. 16 different tape and disk commands. Conversion of all graphic and control codes into readable text. Re-set switch.	64,128	From £24.95 to £39.95	Centresoft



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MODEL 92008/G – DOES IT ALL!

Full Commodore graphics and special characters, tabs, dot graphics etc. Plus 8K buffer. **£64.99**

ALSO

MODEL 92000 – less graphics	£49.99
MODEL 92000/G – with graphics, no buffer	£59.99

All models software transparent – no driver needed.
Connect to C16 or Plus 4 (with optional mains adaptor). VIC 20, C64 or C128 or daisy chain to disk chain.
Includes printer lead – nothing more to buy.

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ADD-ON GUIDE

GTL 1	This cartridge enables your 1541 disk drive to load 4-5 times faster. Many useful features including abbreviated load/save commands and unique on/off switching etc. Designed to work with most games.	64	£18.00	Trilogic
GTL 2	As above with built-in reset switch	64	£19.00	Trilogic
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Turbo 64	A disk specially formatted with the fast load feature built in. Once the disk is made it will load on any unmodified Commodore 64 and 1541 disk drive without having to load anything first. Loading time is 5 times faster and programs can be selected and run from a menu by the press of a single key. To make a Turbo 64 disk all you do is copy the programs from your source disk onto the specially formatted Turbo 64 disk using the Editor.	64	£19.99	Cockroach
1541 Express	Cartridge — two leads clip inside the computer. Works with most business software.	64	£34.95	Ram

Joysticks/Trackerballs

Product	Features	Commodore Machine	Price	Company
Formula I	Bright blue, 2 fire buttons,	64, VIC 20	£16.95	Kempston
Formula II	Bright blue, 3 fire buttons, leaf switch	64, VIC 20	£11.95	Kempston
Sure Shot Standard	Black & red, 2 fire buttons	64, VIC 20	£15.95	Cookridge
Deluxe	Black & red, 2 fire buttons, one on	64, VIC 20	£17.49	Cookridge
Zipstick	Black & red, 2 fire buttons	64, VIC 20, C16	£10.75	Cookridge
RB II Marconi	Tackerball with software — cassette or disk	64, VIC 20	Cass £59.50 £69.50	Central Trade Exchange
Competition Pro 5000	Black, 2 fire buttons	64, VIC 20	£16.95 RRP	Dynamics
Commodore Joystick	Cream, one fire button on base	64 VIC 20	£7.50	CBM UK Ltd
Commodore Joystick	Charcoal black, one fire button on top of handle, contoured, very sensitive	C16, Plus 4	£9.99	CBM UK Ltd

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Delta 3SC	Black, or black with red stripes, 3 fire buttons, light fast action	64, VIC 20 128	£12.00	Voltmace
Computec	Black, 2 fire buttons	64, VIC 20	£9.95	Micropride
Atari joystick C x 40	Black, one fire button	64, VIC 20	£7.99	Atari
Atari Trakball C x 80	2 buttons, rolling ball in centre	64, VIC 20	£9.99	Atar
Vulcan Gunshot I	Cream & beige, 2 fire buttons, suction pad underneath	64, VIC 20 128	£8.95	Vulcan
Vulcan Gunshot II	Black, 2 buttons, autofire, suction pad underneath	64, VIC 20 128	£9.95	Vulcan
Quickshot 1	Black & red, 2 fire buttons	64, VIC 20	£6.95	Spectavideo
Quickshot 2	Black & red, 2 fire buttons, autofire	64, VIC 20	£9.95	Spectavideo
Quickshot 4	Black & red, 2 fire buttons, choice of 3 different handles	64, VIC 20	£13.95	Spectavideo
Quickshot 9	Joyball — half sphere on large base, microswitches, 2 big fire buttons at bottom of unit. Players 1 and 2 switches, autofire. Cream & brown.	64, VIC 20	£13.95	Spectavideo
Hotshot (REVS)	Analogue, designed for Firebird game. REVS, also switchable to normal, one fire-button	64/128	£12.95	Meedmore
Professional	Accurate, dual fire buttons, auto fire select		£19.95	Euromax
Quickshot II+	Microswitches, large grip, dual stick fire buttons		£13.95	Palan
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Kraft	4/8 way switch, highly accurate, ideal for graphics programs		£9.95	Vulcan
Microswitch	Metal shaft, very durable, large fire button, accurate		£11.95	Vulcan
CL128/CL123	Low price, high quality, proven design, CL128 has auto-fire		£7.95/ £5.95	
Turbo Ace	Fire button on steering wheel, speed regulation and centralisation	64	£29.95 + £1.50 delivery	Apollo
Ballpoint	Icon manipulation 16 colours (any 4 usable at once), sections of drawings may be picked up & moved, drawings compatible with light pen drawings, optical trackerball, trackerball or joystick.	64/128	£29.95	Meedmore
Champion	Built-in autofire, 2 fire buttons	64 (C16 & Plus 4 via interfacing)	£9.99	Baylin
Boss	Grey with black handle, heavy duty construction with split second reaction	64 (C16 & Plus/4 via interfacing)	£15.99	Baylin
Bat Handle	Dual fire button	64 (C16 & Plus 4 via interfacing)	£27.99	Baylin

ADD-ON GUIDE

Super 3-way	Control customized for any game, dual fire buttons, direction option, 4 & 8 position, 3 arcade handles	64 (C16 & Plus/4 via interfacing)	£32.99	Bayling
Mach 1	Black with 4 red buttons. Moulded handgrip and an autofire switch	64, VIC 20	£8.95	Cheetah
Speedking	Hand-held, moulded case, one trigger-fire button	64/128 C16 + 4 VIC 20	£14.99	Konix
Quickshot II	Charcoal Black, 2 Fire buttons & Auto Fire		£7.99	

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Computereyes	It will digitise from camera, video recorder, video disk and images can be stored on disk. Also enhancements to allow the use of computereyes with some of the popular graphic packages for the Commodore.	64	£139.00	Stem
SCAN-64	Digitizer plus graphics editor. Comes as a set with optical scanner and mounting bracket, diskette, cable and manual.	64	£89.50	Jansen

MISCELLANEOUS

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Datapad 16C	Keypad is a strong metal case. It plugs in externally and comes complete with software to define the keypad to your choice of layout.	64	£34.95 incl.	Voltmace
Beasty Infra-Red Controller	Infra-Red module. Capacity for up to 8 servos. Precision motors of type used in radio-control models. Battery operated. 3 motors in pack.	64 (inc VAT)	£143.75 Ltd.	Commotion
RC 100	Simple powerful wrist terminal. In 10 seconds you can enter the information you select from your computer by connecting Seiko's Wrist Terminal to your RS232C part of your personal computer which can generate a RS232C signal. Eighty 'pages' of 24 characters can be input. Watch functions — time & calendar. Terminal functions — memo, world time, weekly alarm, schedule alarm.	64/128 cass disk	£89.95 £99.95	Hattori
RC 4000	As above extra facilities by directiona! communication with Com 64. Also communicate other perifal devices. Accoustic cuplers or other RC 4000 watches direct.		£59.99-99.99 software extra Cable & software set for Com 64 additional £24.95	Hattori

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MCS	Combines interface, MIDI link and comprehensive disk software	64 + 128	£225	Joreth Music
AMS	Editor, keyboard, linker synthesiser and MIDI modules	64/128	£39.95	Rainbird
Comdrum	Digital Drum Software. 20 voices, full sequencing and editing.	64/128	£9.95	Datel

Lightpens	**Features**	**Machine**	**Price**	**Company**
Datapen	Buff casing, no interface needed	64, VIC 20	£25.00	Datapen
Trojan Lightpens	Black. Will draw freehand, can magnify or reduce, can fill in with either colour or 2 different patterns	64, VIC 20, +4 C16	£19.95	Trojan
Stack Light Pen	Unique torch contact switch. Pixel accurate supplied complete with paintbox draw software and 10 pen games. All standard features plus animation and C.A.D. support. Full colour	64, VIC 20	£28.00	Meedmore

Grapics Tablets	**Features**	**Machine**	**Price**	**Company**
Grafpad II	Use to design circuit diagrams, mechanical engineering & kitchen designs, in general CAD packages	All	£59.50 total package	British Micro
Super Sketch	Graphics tablet with many features, which comes complete with Starter Kit	64 £44.95	£44.95	Anirog

Mice	**Features**	**Machine**	**Price**	**Company**
Datex Mouse	Mouse, tape & disk software	64	£49.95	EEC
The Magic Mouse	Mouse, tape & disk software	64	£59.95	SMC
MS 2000 V	Optical encoding and a comprehensive cassette + disk-based software	64 12	£69	Wigmore House
Neos Mouse	Cassette only. Software program called cheese	64/128	£44.90	Wigmore House
Desk Top	Includes 100 year calendar calculator, diary, clock, communication facilities, disk utilities etc. And more. Use with mouse joystick or keyboard. Cassette & disk.	64/128	£18.50 incl. VAT	Wigmore House

MOTHERBOARDS

Stack	4 slot motherboard (adaptor). Has a unique switching system for each of the 4 cartridge slots which allows the user to turn on and off cartridges without removing them from the computer.	64, VIC 20 128/128D	£28.00	Meedmore

Product Update

MAGIC DISK KIT

The Magic Disk Kit from Robtek is intended to help you keep your 1541/1570 disk drive in top condition. It allows you to realign your drive when the dreaded 'bumps' have knocked it out of alignment, and clean the head when it gets dirty.

The Magic Disk Kit consists of two disks, a program disk and a head cleaning disk, and a small manual, in a sturdy plastic case. The disks sleeves are a distinctive white colour. The disk labels and jackets are brown. The overall effect is very pleasing and unusual. The manual, although small, is very clearly printed and well laid out.

The manual starts with a section of commonsense tips on general care of your disks and disk drive. The loading instructions follow, and some advice if trouble is experienced with loading due to the drive being badly out of alignment. The manual then goes on to describe the use of the Speed Test and the Alignment Test. The use of the cleaning disk is then described. We then come to the interesting part, how to adjust the disk drive when either the Speed Test of the Alignment Test fails. The manual concludes with some advice on how to rescue a disk which has been badly contaminated (e.g. by having coffee split on it) and how to permanently change the disk drive device number.

The section of simple maintenance tips are all good advice. The only point I would take exception to here is the advice to clean the disk drive head regularly using the cleaning disk provided. Any cleaning system must be abrasive to some extent, and therefore should only be used when necessary. I have used a 1541 disk drive for over three years now, and I have never had any trouble in this regard. The drive head will wear out eventually. Why speed up the process?

The loading instructions are very clear and simple. The kit can be used with a drive with any device number from 8 to 12, and device number selection is simplicity itself.

The Speed Test checks the speed of the disk ten times. A check of the drive belt is also carried out. The display of the results is well laid out and easy to understand. The Alignment Test checks the head alignment at three places on the disk, inside, middle and outside edge. The test checks the positioning of the head using test patterns on the disk on half tracks and full tracks. Again the display is clear and fairly easily understood. A helpful addition would have been some examples of the display for a misaligned drive.

The only place where the documentation falls down is when we come to the instructions for taking the disk drive apart! It tells you how to take off the lid, but then forgets to tell you to take the chassis out of the bottom part of the case. This is necessary to allow access to the screws that hold the stepper motor in place, and also to adjust the speed of the motor. Aside from this slip, the instructions are clear and easy to follow.

The manual concludes with instructions on how to (possibly) rescue a disk which has suffered an accidental bath, and how to permanently alter the disk drive device number. Both useful things to know, although the rescue procedure for the disk is a bit of a gamble.

Overall, only two small slips in the documentation. Considering that the average cost of having the disk drive overhauled is £25, if you haven't got any means of aligning your drive, this is well worth looking at. The Magic Disk Kit is available from Robtek Ltd., Unit 4, Isleworth Business Complex, St. John's Road, Isleworth, Middx. TW7 6NL. Telephone: 01-847-4457.

D.J. Barnes

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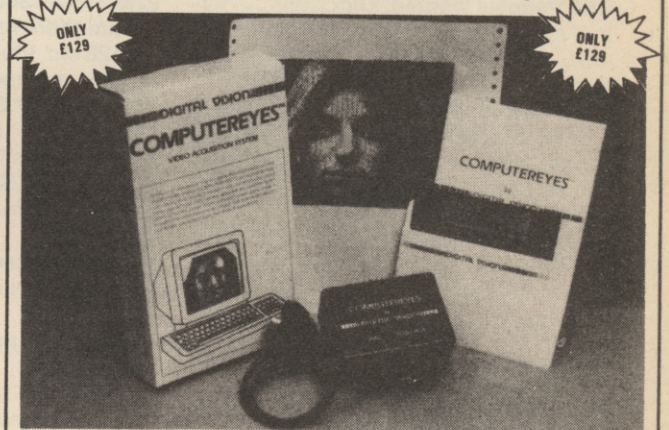

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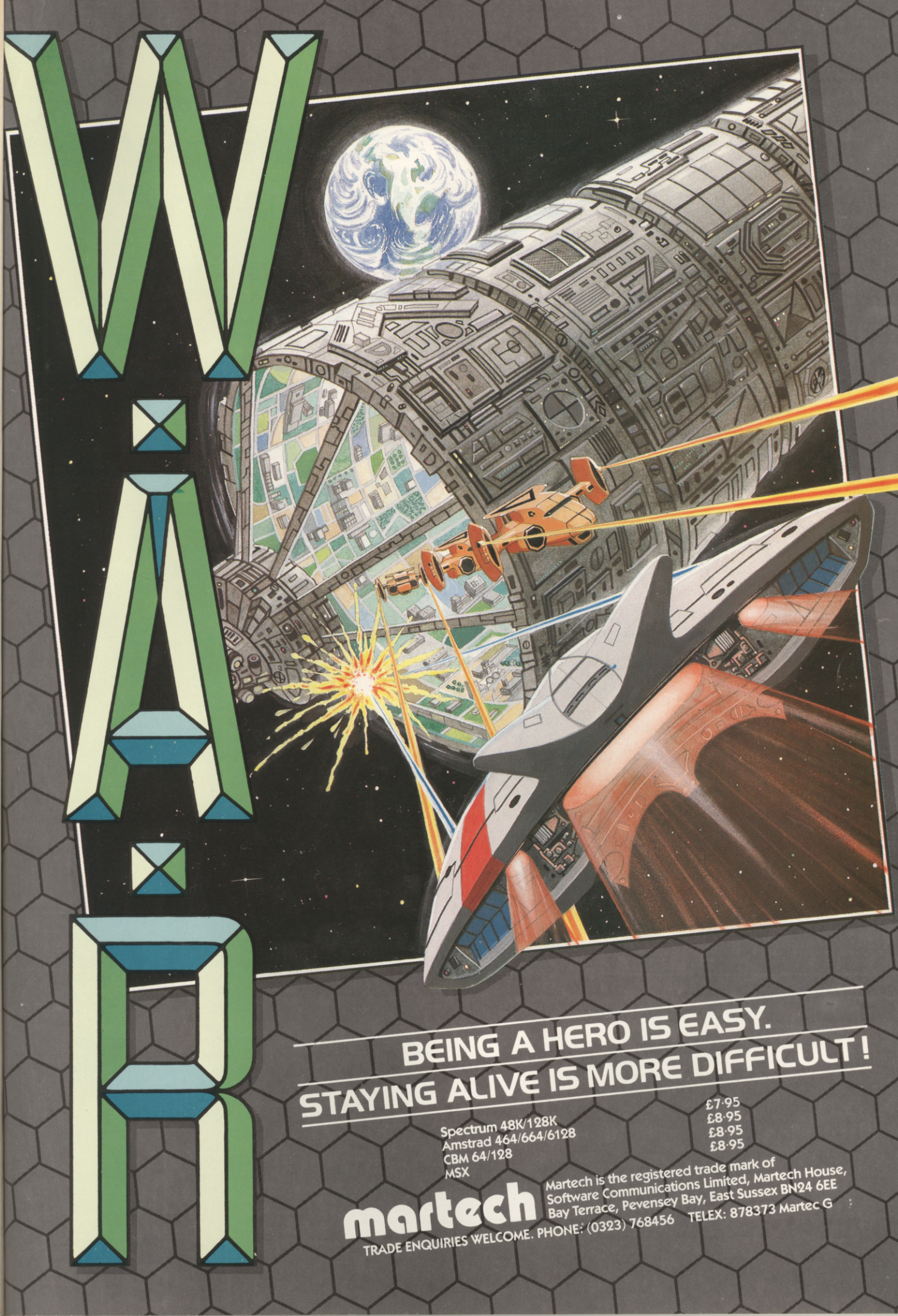

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